AMERICAN GAS ASSOCIATION MONTHLY

Vol. I Nos. 11-12

November - December, 1919

OUR DOUBLE ISSUE

Completes Volume 1

When a national convention determines a number of matters for immediate transmission to our members, besides setting into motion new forces for organization and reorganization of Association activities—

and a printers' strike interrupts the smooth running of headquarter's routine—

and the date of issue of Volume II of the *Association Monthly* is changed from the 20th to the 1st of each month—

Then we issue a double number—November-December—with a quantity and quality of material that we trust will make a fitting climax for our first year of publication.

ENTERED AS MATTER OF SECOND CLASS AT THE POST OFFICE, EASTON, PA.
Acceptance for Mailing at Special Rate of Postage Provided for in Section 1103, Act of October 3, 1917, Authorized July 16, 1918

1919

A Merry Christmas

and

A Happy New Year

1920

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VOLUME I NOV.-DEC., 1919 NUMBERS 11-12

AUTHORS

AMERICAN GAS ASSOCIATION MONTHLY
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AMERICAN GAS ASSOCIATION
MONTHLY

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130 E. 15th St., NEW YORK, N. Y.

Editor, ... Louis Stotz
Associate Editor, . T. Marion Will

Vol. I NOV.-DEC., 1919 Nos. 11-12

WITH THE EDITOR.

The Vital Need for Gas Statistics

For some time past we have recognized the growing need for statistics of the gas industry. The Secretary-Manager in his report, as presented at the First Annual Convention said:

"There is in the gas industry a notable lack of statistics vital to a clear presentation of its status and to serve as a record of its progress as a whole. The constant inquiries that are received at the Association headquarters emphasize the need for such information and the lack of it is frequently complained of.

"It is proposed to attempt the compilation of such data as can best serve the interests of the industry, and more ready response to requests for such information than has been forthcoming in the past is earnestly hoped for.

"Questionaires remain unanswered or entirely ignored. We realize that, through abuse, the questionaire has become an irksome thing. It will be the policy to limit such inquiries to those serving a useful purpose for the benefit of the whole industry, and with that assurance we couple the earnest request for prompt co-operation and response to requests for essential information which may in the future be directed to our member companies."

We believe that an effective publicity that will be of interest to the reading public can be successfully carried on for the benefit of the gas industry. The new Advertising Section will devote much effort to this public education but it must have ammunition. We want to take every possible advantage of the opportunities which constantly present themselves for the broader dissemination to the public of information regarding this vast industry, but we must have that information at hand to do it.

Articles dealing with industry generally are achieving more and more popularity in the magazines and popular periodicals, but if the gas industry is to figure in this awakening interest we must have essential information to give to the writers or to use as the basis for articles of our own preparing. The headquarters of the Association receives frequent requests for data as to the status and progress of the gas industry and we respond as fully as the information at hand makes possible, but that information is inadequate to enable us to do all that we want to do.

Within a few months, or possibly a few weeks, gas companies will be called upon to file the schedule required by the Bureau of Census of the Department of Commerce.

We are now preparing a similar and more comprehensive schedule which we shall shortly request gas companies to file with this Association as their National representative and which will give us information which can be used for the benefit of the whole gas industry in the United States.

This is in the nature of a declaration of intention and a request in advance to give the questionaire the consideration it deserves when it comes to you.

Is there any more logical place for accurate, up to date information of the gas industry than in the headquarters of this Association from where it may be most effectively circulated for the industry's benefit?

Another Time

There have come to the offices of the Association some highly gratifying words of encouragement and congratulation on the success of the First Annual Convention. Such expressions are highly prized. Those of us who looked upon it from the inside saw many little weaknesses and defects in the arrangement of details which, viewed in the afterlight, may not have been as important as they seemed to us. But if we practice the doctrine we expound they will have served their useful purpose in pointing the way for improvement next year. In some of the sectional meetings, the length of program of papers and reports prevented adequate discussion. We are firm believers in the value of discussion. It is often of greater practical benefit than the paper or report which calls it forth. This and other points have impressed us as providing an opportunity for improvement twelve months hence. In the meantime our chief interest lies in making those twelve months productive of tangible, definite accomplishment, that will justify the confidence of the gas companies of the United States in their national organization and deserve the support of those who have yet to become members.

AMERICAN GAS ASSOCIATION MONTHLY

Vol. I NOVEMBER-DECEMBER, 1919 Nos. 11-12

Association Aid for Gas Companies in Present Coal Crisis

AS our member companies are already aware through the special service letters which have been sent them and all other gas companies, the National Committee on Gas & Electric Service was promptly revived to meet the needs of the utility interests in the coal crisis precipitated by the strike of the bituminous miners. The committee reopened its offices in the Munsey Building in Washington, with George W. Elliott, Secretary, in charge.

The developments of the first few days necessitated a prompt readjustment of the method of handling the interests of public utilities and of insuring effective presentation of their needs before the various regional and district coal committees which had been appointed by the Railroad Administration.

The following is taken from the second of the letters above referred to.

The regional and district coal committees have full authority to act on all matters relating to the distribution of coal for the electric railways, electric light and power companies and gas companies.

The National Committee on Gas and Electric Service has appointed through the Central Coal Committee a Public Utility Representative to keep in touch and serve with these regional and district coal committees, and to put at the disposal of these committees their entire information with reference to the requirements and necessities of the various gas and electric plants within each region. It will be the purpose of the Public Utility Representatives to insure the prompt and impartial allocation of coal to utility plants with due regard to the supply on hand and the necessities which may exist in each case.

The Regional and District Coal Committees so far appointed are as follows, and in each case the name of the Public Utility Representative is given.

Additional regional or district committees will be appointed by the Central Coal Committee as the necessity arises,

and in each case a Public Utility Representative will be appointed to cooperate with the new committees formed.

Relief will be obtained through the regional coal committees or through the District Coal Committees, where such district committees have been appointed by the Railroad Administration. You are undoubtedly already familiar with the boundaries or limits of the regions in which your operations are carried on. They correspond to the present regions of the Railroad Administration, and in case of doubt inquiry of any railroad official will promptly disclose this information in detail.

All matters relating to the supply of coal for gas companies should be taken up direct with the Public Utility Representatives of the National Committee on Gas and Electric Service in the respective regions and districts given in the foregoing. In applying for assistance to our representatives on the Regional or District Coal Committees, it is of the utmost importance that careful and accurate data be given of the number of days supply of coal on hand, the daily consumption of coal and general information of the services performed by the utility in question, in order that the Utility Representatives may handle the situation effectively.

Under the plan now in force requests are not to be forwarded to the National Committee on Gas and Electric Service at Washington. Such requests for assistance must go direct to the Public Utility Representatives on the Regional and District Coal Committees announced herein.

The National Committee on Gas and Electric Service is impartially representing the National Electric Light Association, the American Electric Railway Association and the American Gas Association, and its representatives on the regional and district coal committees should receive the complete cooperation of all electric light and power, street railway and gas companies operating in their region or district.

REGIONAL COAL COMMITTEE	PUBLIC UTILITY REPRESENTATIVE
Southwest Region—St. Louis	
P. H. Greenlaw, *Chairman*	C. L. Holman, Laclede Gas Co., St. Louis, Mo.
C. A. Howe	
Z. W. Brice	
J. G. Livengood	
Southern Region—Atlanta, Ga.	
A. M. Smith, *Chairman*	Rawson Collier, Ga. Ry. & Power Co., Atlanta, Ga.
J. J. King	
Horace Epes	
F. H. Fechtig	
S. L. Yerkes	
G. W. Lamb	
Northwest Region—Chicago, Ill.	
T. W. Proctor, *Chairman*	Jno. P. Gilchrist, *Vice-Pres.* Commonwealth Edison Co., 72 West Adams St., Chicago, Ill.
Geo. W. Reed	
Central West Region—Chicago, Ill.	
B. J. Rowe, *Chairman*	Geo. P. Mitchell, *Asst. to Pres.* Peoples Gas Light & Coke Co., Michigan Avenue, Chicago, Ill.
P. Hunter	
F. C. Honnold	

Eastern Region—New York, N. Y.		
	G. N. SNIDER, *Chairman*	*Nor. N. Y.* N. & W. of Albany,
	A. K. MORRIS	J. T. HUTCHINGS,
	R. D. STARBUCK	Rochester Ry & Lt. Co.,
	A. E. RUSSELL	Rochester, N. Y.
	F. B. WRIGHT	*N. Y.* South of Albany,
	H. L. INGERSOLL	CLIFTON W. WILDER,
	J. W. SEARLES	N. Y. Edison Co.
Allegheny Region—Philadelphia, Pa.		
	J. B. FISHER, *Chairman*	J. A. PEARSON,
	E. H. BANKARD	The United Gas Improvement Co.,
	W. S. YEATTE	Philadelphia, Pa.
	J. W. LAUREL	
	G. C. FOEDISCH	
Pocahontas Region—Roanoke, Va.		
	D. E. SPANGLER, *Chairman*	J. W. HANCOCK,
	E. J. HOWE, Fuel	Roanoke Ry. & Elec. Co.,
	E. T. BURNETT	Roanoke, Va.
	J. W. COXE	
	T. D. HOBART	

DISTRICT COAL COMMITTEE	PUBLIC UTILITY REPRESENTATIVE
New England—Boston	
P. R. TODD, *Chairman*	C. H. HODSKINSON,
	Edison Electric Ill'g Co.,
	70 State St.,
	Boston, Mass.
Cincinnati	
H. A. WORCESTER, *Chairman*	W. W. FREEMAN, *Pres.*
	Union Gas & Electric Co.,
	Cincinnati, Ohio.
Detroit	
P. G. FINDLAY, *G. F. A. M. C.*	B. E. MORROW,
	Consumers Power Co.,
	Jackson, Mich.
Kansas City	
WM. CORBETT, *Chairman*	P. J. KEALY, *Pres.*
	Kansas City Ry. Co.,
	Kansas City, Mo.
Omaha	
WM. JEFFERS, *Chairman*	J. E. DAVIDSON, *Vice-Pres.*
	Nebraska Power Co.,
	Omaha, Neb.
Des Moines	
C. W. JONES, *Chairman*	E. G. SCHMIDT, *Pres.*
	Des Moines City Ry. Co.,
	Des Moines, Iowa.
Peoria	
H. D. PAGE, *Chairman*	R. S. WALLACE, *Vice-Pres.*
	Central Illinois Light Co.,
	Peoria, Ill.

A. G. A. Assessment for National Committee on Gas and Electric Service

THE following letter has been sent to all of our company members. To make sure that it has reached the proper man in each company and to urge upon all the importance of immediate attention to the matter which it presents, we reprint it here in full

To A. G. A. Company Members:

The National Committee on Gas and Electric Service has again opened offices in Washington, to handle the interests of the utilities during the present coal crisis.

You are undoubtedly familiar with the very important work carried on by this body from June 1, 1917 to February 1, 1919. Its organization was prompted by the desire of the utilities to render service to our government during the stress of war. Headquarters were maintained at Washington and not only was the Committee's first purpose achieved in a highly efficient manner but through its efforts, the interests of the gas companies received special attention when utility problems were under consideration. One result of the Committee's past work is the standing of utilities on the priority lists of industries issued by the Fuel Administration in connection with the present coal situation.

The expenditures entailed in conducting such work reached a considerable sum, payment of which was guaranteed, in carefully apportioned amounts, by the National Electric Light Association, the American Gas Association and the Natural Gas Association of America, and a similar apportionment will be made of the amounts required by the Committee's present activities.

Of the total amount expended to February, 1919, $15,687.46 was assessed against the artificial gas interests. $7,342.99 has been collected from gas companies and paid over to the Committee. Thus, the American Gas Association owes a balance of $8,344.47 in addition to the new assessment.

In order that we may liquidate our indebtedness at once and bear our share of the Committee's present running expenses, your company, in conjunction with others, is called upon to subscribe to a fund for this purpose, *on the basis of $10.00 plus one hundredth of one per cent. of your annual income from gas sales,* with the understanding that should the subscriptions from all companies exceed the amount required, then the subscribing companies will receive a refund proportional to their subscriptions.

Payment of subscriptions should be made direct to the order of the American Gas Association.

Very truly yours,

(Signed) HENRY L. DOHERTY,

Chairman of Special Committee to raise fund re expense of National Committee on Gas and Electric Service.

A Fine Chance for Effective Cooperation

WE frequently receive requests for information regarding new developments; we are asked if we know of any investigation of a certain new gas manufacturing process, a new invention or something of the like.

The headquarters of the Association is the logical place to which such inquiries should be directed, and we are frequently able to be of service in these matters. If, however, an interested membership would keep us more fully informed, the industry would benefit materially thereby. Of course we realize that in some cases investigations are of a confidential nature, but many others are made, the results of which could very properly be given out in response to inquiries from other gas companies. Companies that prefer, could have inquiries addressed directly to them, by informing us concerning their line of investigation and its confidential nature.

The whole purpose of this suggestion is that the Association may promptly supply information asked for; that it may serve as a clearing house for the interchange of all classes of data of interest and value to gas companies, and that in so doing it may largely eliminate the duplication of effort and expense through the reciprocal exchange of useful information in the industry which it represents.

We submit this as another opportunity for cooperation between gas men for their mutual benefit. We need a more extensive give and take of data of all sorts, a more extensive dissemination of the details of our business, and a more liberal spirit on the part of some and a more receptive spirit on the part of others in establishing this reciprocal relation within the industry. This kind of bread cast upon the waters is certain of its returns.

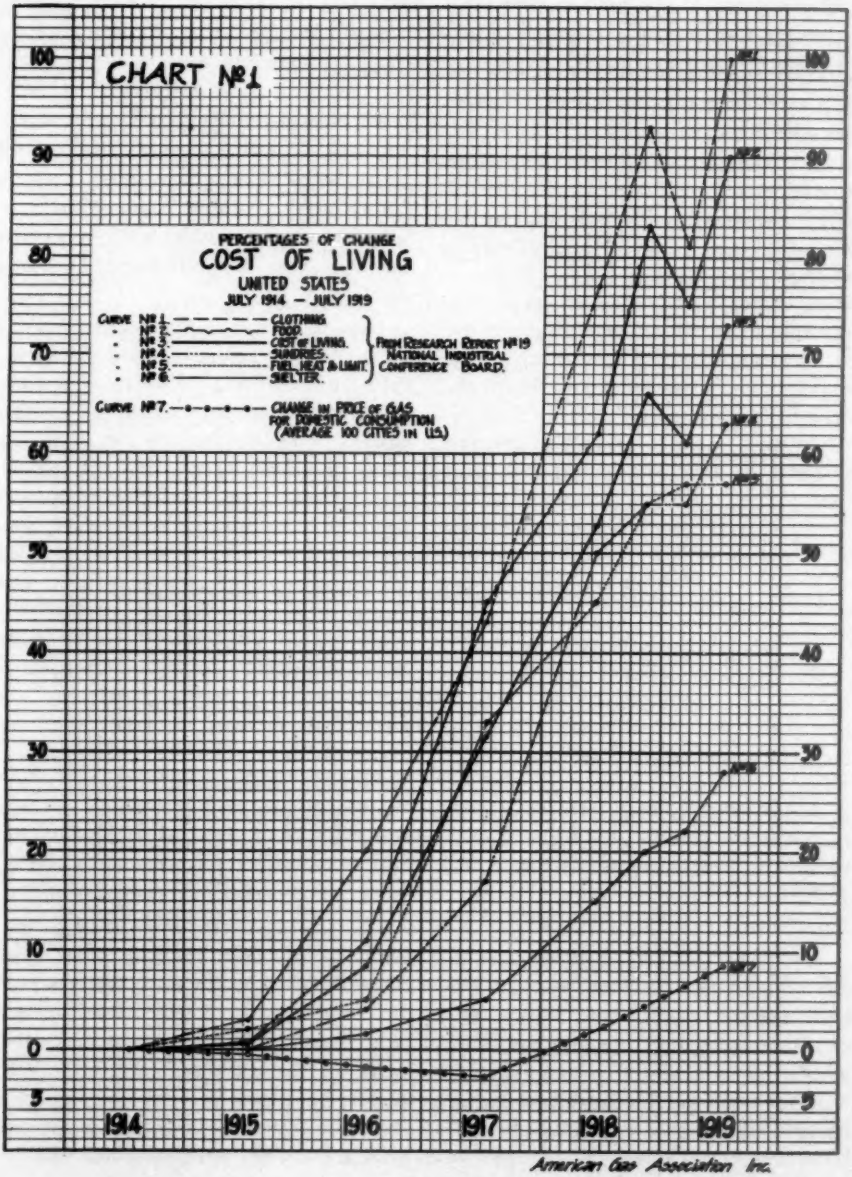
No Saturation Point in the Gas Business

To those who are prone to speak of the domestic field as "saturated" (which, by the way, we think is an unfortunate and an inaccurate term) we give as just one example—the gas operated ironing machine.

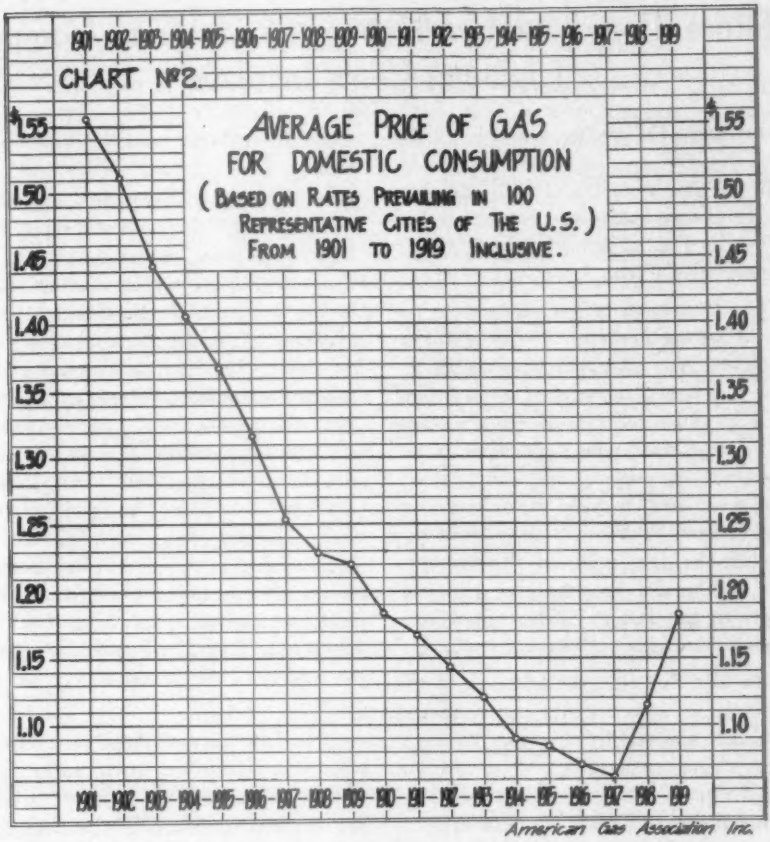
How many gas companies are actively pushing these appliances and displaying them on their floors? Electric companies are selling them to such an extent that prompt deliveries cannot be made because the demand exceeds the supply, and in many cases the electric companies sell them where there is no other electric feature than the small motor, the heating being done entirely by gas. Gas furnishes a better heating medium than electricity for this purpose because better regulation can be secured. The electric companies are naturally pushing the electric device and are selling an increasing number on the "convenience" argument. Just another example where the buying power of the public has been underestimated by gas companies to their loss, but clearly demonstrated by electric companies to their gain.

We have suspected that the term "saturation" has been used, in some cases at least, to express what is really a state of "stagnation". There is no "saturation" point in the domestic or any other field for the utilization of gas. Why should the head of a family pay from $500 to $1,000 for a player piano and balk at $175 for an ironing machine?

Look where GAS is! Away at the bottom of the price climbers!



American Gas Association Inc.



The Story the Charts Tell

In studying Chart No. 1, attention is especially invited to curve (No. 5) representing the increase in cost of fuel, heat and light. This is intended to reflect the increase in price of these commodities insofar as they enter into the cost of living and of course includes all sources of fuel, heat and light. Comparison of this curve with that indicating the price tendency of gas for domestic consumption (No. 7), emphasizes to what an inappreciable extent the price of gas has entered into the increased cost of living, and further emphasizes the increases which have occurred in the case of other fuels and forms of heating and lighting energy. Curve (No. 7) is based on the average price of gas for domestic consumption in 100 cities in the United States, so distributed both as to size and geographical location, as to give a reasonably accurate indication of the price tendency throughout the country, and is derived from statistics published in Brown's Directory.

The general tendency of the price charged for gas for domestic use for the past nineteen years is indicated by the curve reproduced in Chart No. 2, derived from statistics published in Brown's Directory. As in Chart No. 1, one hundred cities have been taken, so distributed both as to size and geographical location, as to give a reasonably accurate indication of the price tendency throughout the country. The curve represents the average for domestic consumption only and does not represent the price charged for industrial gas or other large volume consumption, which in many cases is subject to a block system or sliding scale.

Utilities Board Allows Public Service Gas Company Eighteen Cents Increase

FOLLOWING is the summary of the decision of the Board of Public Utility Commissioners at Trenton on November 20 in the rate increase asked for by the Public Service Gas Company in June, 1919.

"The Board, therefore, finds that, using the determinations of this board in the Passaic gas case, dated December 26, 1912, as a basis, the rate of ninety cents per thousand cubic feet therein found to be just and reasonable by reason of the increase in the costs of operation has become insufficient to yield to the company a fair return of not less than eight per cent. on the fair value of the property used and useful in supplying the customers of the Public Service Gas Company in the Passaic division.

"We also find that the addition of the surcharge of seven cents per thousand cubic feet allowed by this board February 27, 1918, to be charged in addition to said rate of ninety cents per thousand cubic feet is insufficient to yield said return on the fair value of the said property.

"We find that the base rate of $1.15 per thousand cubic feet, proposed to be charged by the company together with the differential rates thereunder set forth in detail on page one of this report will furnish to the company a fair return at not less than eight per cent. on the fair value of the property used and useful in supplying the customers of the Public Service Gas Company in the Passaic division, including Ridgewood.

"Out of this rate we find that the sum of three cents per thousand cubic feet of gas sold annually shall be appropriated to the reserve for amortization of fixed capital.

"In that the said company operates in territory other than that embraced in the 'Passaic division,' and the existing rates in effect in said territory are the same as the existing rates in effect in the 'Passaic division,' by reason of the adoption by the Public Service Gas Company of the recommendation of this board in its report of December 26, 1912, we find that said existing rates are unjust and unreasonable and insufficient, and that the schedule of rates filed and proposed to be charged by the company in said territory is just and reasonable, and that the company shall appropriate from the revenue produced thereby three cents per thousand cubic feet of gas sold annually to the reserve for amortization of fixed capital.

"The new rate shall become effective with the December, 1919, sales, and a formal order will be entered providing for the appropriation to the reserve for amortization of fixed capital above referred to."

The new rates are as follows:

Per Month	
First 20 m. c. f.	$1.15
next 30 m. c. f.	1.10
next 50 m. c. f.	1.05
next 50 m. c. f.	1.00
next 50 m. c. f.	.95
next 100 m. c. f.	.90
next 500 m. c. f.	.85
all over 800 m. c. f.	.80

The above rates are to be applied to each installation or plant. The consumption of gas by the same consumer in different plants or localities will not be combined.

More "Scientific" Bunk

One of the metropolitan newspapers recently published an article under the title—"The Child's Air Ration," from which we quote:

> "Do not allow children to sleep in rooms in which are gas or oil fires or lighted gas burners, even if turned low. This is a common cause of anemia and malnutrition."

We don't know the learned member of the medical profession who wrote this article, but we found it difficult to accept his statement that a common cause of malnutrition and anemia was the practice of allowing children to sleep in rooms "in which are gas or oil fires or lighted gas burners, even if turned low," and so we asked some questions of the Chief Sanitary Officer of the Health Department of one of our largest cities, not for a criticism of the statement, but merely whether he concurred in the opinion therein expressed. This gentleman, with a wide experience to draw from, says among other things:

> "As is usual with semi-scientific articles which are written for the lay mind, most of the items should be taken 'cum grano salis'. The statement, to my mind, is one of the most ridiculous statements a scientific or quasi-scientific person could possibly make.
>
> "The amount of carbon dioxide present from illuminating gas is of negligible effect. Products of incomplete combustion from oil burners might be irritating to the respiratory product. This, of course, would not occur by combustion of illuminating gas. The product of such combustion would be CO_2, H_2O and possibly a small amount of C.
>
> "The causes of malnutrition and anemia are improper feeding which is of primary importance, lack of sunlight and fresh air."

We do not think that our title over this article is a particularly dignified one, but we cannot think of anything else at the moment that applies more appropriately.

Fundamental Facts re Public Utilities

The following information has already reached our member companies through the special letter which was mailed on November 6:

The American Electric Railway Association intends to print the Proceedings before the Federal Electric Railways Commission in such form as to include, besides the testimony, the exhibits, the brief of the Committee of One-Hundred, of the A. E. R. A., the report of the Commission and a comprehensive index. It is understood that these will be available for distribution about the middle of next January.

It is believed that these proceedings will constitute the most complete presentation of the fundamental facts concerning public utilities that has yet been made in this country, and that they will be of very great value to all public utilities in connection with rate cases and other matters involving public relations.

A Special Committee of the A. G. A. cooperated with the Committee of One-Hundred of the A. E. R. A. in this matter.

Several requests by gas companies for copies of these Proceedings have been received and if your company desires one or more, your order must be sent to us at once, for both the number to be printed and the price will be governed by the demand.

The Proceedings will be of undoubted value to public utility companies for reference purposes.

The Bulletin of Abstracts

PRAISED BY MEN WHO USE IT

FOR thirteen years the *Bulletin of Abstracts* survived the scrutiny of boards of directors, secretaries and special investigations into its value. Men who are on the subscription lists were recently asked point blank how valuable they considered this bi-monthly compilation of articles important to the gas industry and in every case they approved it, while an analysis of their answers indicated that the degree of approval corresponds to the degree of use made of the *Bulletin of Abstracts.*

More than one gas company has found that its executives, managers and department heads are unable to read the journals, both domestic and foreign, which contain articles of the utmost value to them. These busy gas men have also been heard to complain that the valuable article which they did read, could not be found at the very moment when it was most needed, because memory had not retained the name of the magazine and the date of issue.

A practical gas company took seriously this fact that managers' desks were piled with unread journals for which considerable sums had been spent in subscriptions. The result was the inauguration of a series of abstracts distributed to its managers, etc., in multigraph form.

Then came the question of the value of this work to the gas industry at large and the American Gas Institute, in 1906, secured permission to reprint the abstracts, which were made up entirely from the gas man's point of view.

Value of Abstracts

Men who have few subscriptions to trade magazines and an inadequate reference library at their command, depend upon the *Bulletin of Abstracts* to keep them in touch with progress.

Men whose desks become buried under valuable journals because of the physical impossibility of reading them all, find the Bulletin of Abstracts the one practical way out.

In other words, the Abstracts are valuable in proportion to the use which subscribers make of them.

How to Use the Abstracts

Suppose you are one of the busy gas men who, taking this article to heart, send in your subscription for the Bulletin of Abstracts. When the first of its six issues reaches your desk, you look it over.

You find a number of sheets 5 x 8 inches, of paper stiff enough for filing. Each has printed across its top two filing classifications, the number of the abstract, the title and place of publication of the article.

The first three or four pages are labelled "Contents" and a glance down the list enables you to pick out the references to your particular subject. Then, depending upon the time at your disposal, you can read through these special abstracts or cover the whole field of two months of gas literature in the brief summaries.

In a remarkably short time you have acquired a comprehensive idea of what your trade journals, foreign and domestic, have been offering.

Filing Essential

With this first copy you have received a "Filing Classification"—"Elec-

tricity, Gas, General and Non-Technical"—each with its proper divisions and their sub-divisions.

You pull the brass pins from the sheets of the Bulletin, separate them according to the classification definitely printed on each sheet, and without the nuisance of clipping and pasting, insert them behind index guides or in folders according to their divisions. The whole task, done by yourself or by an office boy who has had no previous training in filing, requires for one issue less than an hour of time.

Tomorrow someone asks you for information on gas service charges or, for example, the steaming of vertical retorts. You recollect something in print on that subject, but what? Picking up your "Filing Classification" you run through the "Gas" section. You find a classification

Coal Gas
Benches
Vertical Retorts
Steaming

and at a word from you, the office boy brings you a folder in which you find "Abstract 6296"—an article by a prominent gas man given in condensed form which includes the important tables. There is in this case probably not even any need to refer back to the original article which is on your library shelves.

Use Shows Value

The following opinions have been expressed by men who use the Abstracts and whose busy working hours make them appreciate every labor saving device and particularly every "safety" device which prevents the sidetracking or utter loss of valuable information. *The subscription price is five dollars.* We expect you to line up with these men.

"The discontinuance of the Bulletin of Abstracts would be a calamity. I cannot say that I read every single one of them or that I refer to the file daily, but I can say that it is the most complete, comprehensive and valuable library that the industry has.

"I speak for all of the officers and men in our organization when I say that of all the text books and data which we have in our various libraries, none means more to us than this Bulletin of Abstracts."

"First, we read this Bulletin in several departments at our plant and consider it of sufficient value to cover the subscription price of $5.00."

"The best comment I can make with respect to the Abstracts is that if the fee were doubled I should still continue to be a subscriber. My impression is that the *Company* members would expend much larger sums to do a similar work within their own companies."

"I unhesitatingly say that I consider them a very valuable acquisition to our other gas literature.

"I feel that it would be a mistake to discontinue the publication of them, unless obliged to do so. My view in this respect is concurred in by others who receive the Abstracts."

"I have found these abstracts of very great assistance. I keep one copy at the office and one copy at the house, and have a regular filing cabinet in which the bulletins are filed, under the proper heading. I use them almost continuously.

"Sometimes the abstract is hardly sufficient, and it is necessary to go back to the JOURNAL from which the abstract was taken but, as a general thing, the ab-

(Continued on page 616)

Accident Prevention in the Gas Industry

A WORKMAN went into a manhole to shut off a valve, and was overcome by gas. A test should be made of the air in a manhole before going down into it.

A laborer pushed a coal car from a trestle into an open elevator shaft. The car and the workman fell to the basement below. Safety gates would have prevented this accident. The workman was also at fault in not looking to see where he was going.

After opening the pockets of a coal car, a workman climbed on top to pick the coal. The coal dropped suddenly through the dump, carrying the workman with it. A plank laid across the top of the car would have afforded the workman a safe footing and avoided an accident that might have resulted fatally.

While using a circular saw, a carpenter had his fingers caught in it. The workman failed to place the guard in position before using the saw, and as a result is minus three fingers.

A small box thrown out of a window struck a passerby on the head. This represents a careless and dangerous practice that might have caused a serious injury.

When about to charge a generator, a workman opened the coaling door before he received the signal to do so. The flames shot out and burned his face and hands. This case of disobedience might have resulted fatally.

After washing his hands in benzol and thinking they were dry, a workman started to turn out the light on a blow torch and his arms caught fire. The workman should have exercised greater care and kept away from open flames.

A length of pipe fell from the top of a pile, smashing the toe of a workman. Greater care in piling the pipe would have prevented this accident.

A laborer was cutting a hole in a purifying box when a chip flew into his eye. This workman took a chance and wore his goggles on his cap instead of over his eyes.

A fireman tried to lift a large iron bucket and strained the muscles of his stomach. This workman should have secured help and worked the safe way.

In order to cut a concrete pavement, a laborer was holding a chisel for other men to strike. The hammer missed the chisel and struck the workman over the eye. Tongs or holding bars would have prevented this accident.

In order to avoid shutting down the press, a charger reached for a briquet that had fallen back. His hand was caught, causing him to lose two fingers. Shutting down the press instead of taking a chance, would have saved this man's fingers.

A laborer's foot became caught between the floor of an elevator and the side of the elevator shaft, tearing the nail from a toe. The laborer should have stood further back from the edge of the elevator where he would not have been exposed to such danger.

A fireman was standing on the end of a valve installing a pipe line. He stepped off backwards, striking his foot against an obstacle and turning his ankle. This accident would not have happened had he looked where he was stepping.

J. B. DOUGLAS,
Accident Prevention Committee.

Engineering Section—National Safety Council

The National Safety Council recently added an Engineering Section to its organization of nineteen sections.

The Council's action was prompted by three considerations:

The growing recognition of the importance of the engineering factor in safety work;

The growing interest in safety work on the part of civil, mechanical, electrical, mining and chemical engineers;

The growing volume of experience and investigation in the engineering problems involved in safety work.

Its functions will be:

(1) To help meet the technical demands of the various industrial sections and furnish them technical information as desired;

(2) To perform technical services for the Council, such as the development of standards and the solution of special engineering problems arising in safety work; and helpful co-operation with other societies which consider the safety phase.

(3) To conduct one or more meetings as a part of the Annual Safety Congress, at which engineering problems shall be discussed;

(4) To conduct, if considered desirable, one or more additional Sectional meetings during the year, or in different localities;

(5) To carry on other activities to promote the Safety Movement and the best interests of the Council.

We believe that the Engineering Section will be of interest to many of our own members whose activities lie in the engineering field and who desire to see the best results of safety education applied to that field while the best talents in it aid the cause of safeguarding human life.

Suggestion for Emptying Fire Extinguishers

We are indebted to Mr. J. A. Robinson, Superintendent, Inspection and Service Department, General Fire Extinguisher Company, for criticism of precautionary measures suggested to avoid a recurrence of an accident due to the handling of a fire extinguisher. Our item, which appeared on Page 449 of the August issue, read as follows:

"While emptying the contents of an acid-soda fire extinguisher, it exploded and injured the workman on the chin.

"Taking off the cap of the extinguisher and removing the bottle of acid before emptying the soda container would have prevented this accident."

Mr. Robinson states, "The purpose of a fire extinguisher is to expel the soda liquid under a pressure which is due to the gas formed by the chemical action of the acid and sodium carbonate in the liquid. The only way we have of knowing that the chemical extinguisher is in working order is to try it out occasionally and recharge it. In order that it may be maintained in good condition the usual requirements are that it be recharged once a year.

"Furthermore, in order to give men knowledge and confidence in operating chemical extinguishers, it is customary to give instructions that they be operated before recharging rather than emptied

Employment Bureau

Facing this page you will find a "Confidential Classification Record" for use by those members who desire to register with the Association's Employment Bureau. Our purpose is to be of service to both employers and employees among members and we shall build up this department and the facilities it can offer as a clearing house to keep pace with the demands made upon us. No charge is made for the service and all communications are regarded as strictly confidential.

SERVICES REQUIRED

WANTED—Industrial Fuel Salesman, capable of handling the larger industrial prospects and able to supervise and instruct salesmen for domestic gas appliances.

Headquarters will be in a central New York State city and operations will cover number of towns operated by a leading operating company.

State fully experience, qualifications, salary expected.

Address replies, giving key number, to American Gas Association, 130 E. 15th St., New York, N. Y. Use form opposite this page.

Key No. 1

WANTED—Man to build up the business and have full charge outside of manufacture and distribution. Must be capable of keeping the books of the Company.

To build up the sales.

To handle meter reading and collections.

General Office Manager, etc.

18,000 population.

1,300 meters.

12,000 population on lines of existing mains.

Address replies to A. G. A. headquarters, using form opposite this page. Use key number.

Key No. 2

SERVICES OFFERED

POSITION WANTED—Manager of Company of moderate size. Age 31, graduate of Stevens, 1912—M. E. Charge of operation and construction. Experience, chemist and plant superintendent; also new business.

Key No. 101

BULLETIN OF ABSTRACTS

(Continued from page 613)

stract covers the article sufficiently well so that it is not necessary to look over the original article.

"If everybody else finds the abstract of as much service as I do, I should think it would be continued; even if they had to pay more money in order that the Association may not be out of pocket."

ORDER YOUR COPY NOW.

FIRE EXTINGUISHERS (Cont'd)

of their contents by removing the cover as you suggested.

"The remedy for the accident quoted above would be to suggest the proper maintenance of the chemical extinguishers and the annual recharging thereof. We think it would be very bad practice to recommend having them recharged by removing the cover and pouring out the contents instead of discharging them in the usual manner."

Fill Out in Detail and Return for use of Employment Bureau Service.

American Gas Association

128 E. 15th Street. NEW YORK, N. Y.

State Here Nature of Position Desired.

_____

_____

CONFIDENTIAL CLASSIFICATION RECORD.

Name ..... Business Telephone .....

Home Address ..... Residence Telephone .....

Position .....

Company Employed by .....

Address .....

Age ..... Birthplace ..... Naturalized ..... Married ..... Dependents .....

Any Physical Disability .....

Education

Common School ..... Course .....

College .....

High School ..... Degree .....

Member of Technical or Trade Association? .....

Experience: Give positions you have held, starting with the last, with the dates of beginning and ending of each position:

	Position	Company	Location	Date of Service	Salary
(a)					
(b)					
(c)					
(d)					
(e)					

(Over)

Give below the detail of your experience in the gas business. State fully the departments in which you have worked,—if in the manufacturing whether Coal, Water Gas, etc., and any specialties you have developed.

Give suggestion for brief ad. as you would insert it in the MONTHLY.

ACCOUNTING SECTION

A. P. POST, Chairman — A. L. TOSSELL, Vice-Chairman

H. W. HARTMAN, Acting Secretary

MANAGING COMMITTEE — 1920

At Large

ALDEN, CHARLES A., Boston, Mass.
BRUNDAGE, H. M., New York, N. Y.
BULFIN, J. F., St. Louis, Mo.
ERICKSON, HALFORD, Louisville, Ky.
PETTES, W. H., Newark, N. J.
POST, A. P., Philadelphia, Pa.
SCHMIDT, WM., JR., Baltimore, Md.
SCOBELL, E. C., Rochester, N. Y.
TOSSELL, A. L., Chicago, Ill.

Representing Affiliated Societies

ARMSTRONG, J. J., Toronto, Can. (Canada)
BARNES, A. M., Cambridge, Mass. (N. E. Gas Eng.)
EATON, H. M., Detroit, Mich. (Michigan)
HAASE, EWALD, Milwaukee, Wisc. (Wisconsin)
JAMES, F. M., Aurora, Ill (Illinois)
MAYNARD, H. B., Waterloo, Iowa. (Iowa)
PORTER, EDW., Philadelphia, Pa. (Pennsylvania)
POTTER, O. F., Newark, N. J. (New Jersey)
SHEARON, B. P., Hammond, Ind. (Indiana)
STOTHART, E. C., Charleston, S. C. (Southern)

CHAIRMEN OF SECTION COMMITTEES ORGANIZED TO DATE

Automobile Cost Accounting—S. J. PALMER, Chicago
Merchandise Accounting—W. A. SAUER, Chicago
Job Order Systems—W. G. STERRETT, Chester, Pa.
Office Labor Saving Devices—J. L. CONOVER, Newark, N. J.
State Representatives—J. W. HEINS, Philadelphia
Uniform Classification of Accounts and Form of Annual Report to Public Service Commissions—W. J. MEYERS, New York, N. Y.
Uniform Accounting Nomenclature—W. H. PETTES, Newark

An organization meeting of the Accounting Section Managing Committee was held on October 30th at Association Headquarters. The following members were present:—

Messrs. A. P. Post, Chairman; Chas. A. Alden, H. M. Brundage, F. M. James, Edward Porter, Wm. Schmidt, Jr., and H. W. Hartman, Acting Secretary.

The chief work of the meeting consisted in proposing and approving appointments of chairmen for committees as indicated at the head of this page.

It was especially suggested that the chairman of the Committee on Contributions to the Monthly keep in close touch with the chairman of the Committee on Office Labor Saving Devices for the carrying out of the Convention recommendation that articles on various parts of the latter subject be published in the A. G. A. MONTHLY.

It was further suggested that the chairman of State Representatives of the Accounting Section keep in touch with the chairman of a similar committee in the N. E. L. A.

A meeting of the Managing Committee of the Accounting Section was held at headquarters on November 20. The following members were present: Messrs. A. P. Post, Chairman; H. M. Brundage, J. F. Bulfin, J. W. Heins, W. J. Meyers, J. S. Palmer, W. H. Pettes, O. F. Potter, W. A. Sauer, Louis Stotz and H. W. Hartman, Acting Secretary. Appointments to committees and the definition of work for the various committees occupied the attention of the meeting. The results of the conferences on committee work will appear in the manual for such work, which is in course of preparation.

It was decided that the Committee on Contributions to the MONTHLY be merged with the State Representatives Committee since it is through the latter that material for publication can be expected.

The Accounting Section is to be represented on the Commercial Section Committee on Work Schedule, and on the Technical Committee on Depreciation Values on Plant and Distribution Equipment. There is also to be a joint committee of the Manufacturers' and Accounting Sections on Trade Acceptances, a subject on which the meeting was addressed by Mr. W. Griffin Gribbel.

COMMERCIAL SECTION

C. A. MUNROE, Chairman — LOUIS STOTZ, Secretary — J. P. HANLAN, Vice-Chairman

MANAGING COMMITTEE — 1920

At Large

BARROWS, GEO. S., Providence, R. I.
BARTLETT, C. E., (Mfr.) Philadelphia, Pa.
BENNITT, GEO. E., New York, N. Y.
BOND, C. O., Philadelphia, Pa.
BURNS, J. J., St. Louis, Mo.
CHRISTMAN, H. S., Philadelphia, Pa.
CLARK, H. H., Chicago, Ill.
CLARK, W. J., Mt. Vernon, N. Y.
DAVIES, J. E., Chicago, Ill.
DODSON, H. K., Baltimore, Md.
DOULL, R. S., New York, N. Y.
ELSMAN, RALPH, Brooklyn, N. Y.
GASTON, LUTHER, Spokane, Wash.
GOULD, WM., Boston, Mass.
HUNTER, HARRY W., (Mfr.) Baltimore, Md.
JARDINE, BERT H., Knoxville, Tenn.
JASPERSON, R. O., Chicago, Ill.
KARSHNER G. M., New York, N. Y.
KING, THOMSON, Baltimore, Md.
KNAPP, F. H., (Mfr.) Pittsburgh, Pa.
LOEBELL, H. O., New York, N. Y.
MACSWEENEY, J. P., Rochester, N. Y.
MAXON, H. R., (Mfr.) Muncie, Ind.
MUNROE, C A., Chicago, Ill.
MYERS, J. B., Philadelphia, Pa.
PEFFLY, I. W., (Mfr.) New York, N. Y.
POST, A. P., Philadelphia, Pa.
RASCH, W. T., New York, N. Y.
STANNARD, CLARE N., Denver, Colo.
TRUMBULL, G. R., New York, N. Y.
VINCENT, G. I., Syracuse, N. Y.
WRIGHTINGTON, E. N., Boston, Mass.

Representing Affiliated Societies

BORDEN, A. W., Hastings, Nebr. (Iowa Dist.)
BOWLIN, M. A., Macon, Ga. (Southern)
BURKE, E. J., Indianapolis, Ind. (Indiana)
CHAMBERLAIN, G. R., Grand Rapids, Mich. (Michigan)
CLARK, H. H , Chicago, Ill. (Illinois)
CRAFTS, H. C., Pittsfield, Mass. (N. E. Gas Eng.)
DUTTON, L. R , Jenkintown, Pa. (Pennsylvania)
HANLAN, J. P., Newark, N. J. (New Jersey)
MCINTYRE, W. H., Ont., Can. (Canada)
ST. JOHN, JOHN, Madison, Wisc. (Wisconsin)

CHAIRMEN OF SECTION COMMITTEES ORGANIZED TO DATE

Sales Development—WM. GOULD, Boston, Mass.
Compensation (Sub)—G. M. KARSHNER, New York, N. Y.
Filling in the Valleys in Gas and Appliance Sales (Sub)—WM. GOULD, Boston, Mass
Maintenance (Sub)—G. I. VINCENT, Syracuse, N. Y.
Putting Non-Profitable Consumers on a Profitable Basis (Sub)—B. H. JARDINE, Knoxville, Tenn.
Sales Campaigns (Sub)—H. K. DODSON, Baltimore, Md.
Work Schedule (Sub)—G. I. VINCENT, Syracuse, N. Y.
Industrial Fuel Sales—H. H. CLARK, Chicago, Ill.
Furnace Performance Standards (Sub)—I. LUNDGAARD, Rochester, N. Y.
Improvement of Atmospheric Burners (Sub)—JEROME BRANDES, Chester, Pa.
Proportional Mixing (Sub)—THOMSON KING, Baltimore, Md.
Recuperation and Regeneration (Sub)—H. O. LOEBELL, New York, N. Y.

A meeting of the Managing Committee of the Commercial Section was held on November 21 at Association headquarters with almost a full attendance of members. Important sales development and industrial fuel problems for the work of 1920 Committees were discussed and decisions reached which will be announced in our next issue. A discussion of the proposed manual of committee duties was also taken under consideration and many suggestions were made.

A manual of the duties and scope of action of each Committee is in course of preparation and when completed will be printed in these pages not only for the benefit of committee men but to show all Commercial Section members the scope and nature of activities undertaken in their behalf. Copies of the material prepared for this manual were sent to all members of the Managing Committee.

Attention is being paid to the benefits to be obtained by cooperation between commercial men and manufacturers of gas appliances on various committees at work in the Sections.

Special attention is called to the three important Commercial Section papers printed in this issue: Mr. Ehlers' Industrial Service report; Mr. Lundgaard's Report on Standard Furnace Performance Specifications and Mr. Dodson's Schedule for Special Sales Campaigns. On all of these papers we want the comments and criticisms of every man.

Industrial Fuel Engineering Service

AMONG the very firm convictions of all gas men present at the Commercial Sessions of the Annual Convention is the conviction that "big business" for the gas industry lies in the application of our product to industrial needs for fuel. It has also been recognized that the increased use of gas in the industries presents a combination of selling and technical problems in which at this time, the latter predominate.

The manufacturers of cloth, leather goods, japanned articles, steel products, precision instruments and 1001 other necessities and luxuries of life, have been taught by war and post-war conditions, the utter need for the closest possible attention to every detail of manufacture. Wasted materials, uncertain results, failure to maintain critical temperatures, due to perverse fires or incompetent firemen, have all entered into the accounts, and the manufacturer is demanding for his factory the best possible equipment and the most dependable and calculable fuel and power. In other words, he is ready for gas whenever the gas company is ready to offer him a definite installation with an assurance of definite results.

Gas companies that have made use of the Industrial Engineering Service of the American Gas Association are ready to testify to two essential characteristics which it possesses: (1) The approach to the manufacturer's prospect is convincing from the first, since the engineer is a man of wide experience, in possession of exact information concerning the particular industry with which he is attempting to deal; and (2) the advice given and the installation planned by this engineer can be depended upon to embody the best known practice in applications of gas.

In a word, the American Gas Association's Industrial Fuel Service has secured results where gas companies have wanted results. The following report as submitted by Mr. Ehlers to the Convention at Hotel Pennsylvania, summarizes the actual work done.

The Association now calls upon the gas companies of the country to consider the situation and to act. The Service is meant to make available the assistance of an expert engineer to those companies that cannot use or afford to pay for the services of such a man the year around. The Service may be taken for one day or one month, or more, to suit the definite work to be accomplished. The gas company can exercise its own judgment in directing the activities of the Engineer while he is in their field or Mr. Ehlers will take the initiative and plan for himself a campaign to secure for them an increased industrial load. A post card to the American Gas Association will bring exact information concerning rates and schedules.

It will certainly be a profitable investment for every manager of a gas company to read the following report and then get in touch with headquarters concerning the use of this Service that, in various towns, has already added thousands of cubic feet per hour to the gas consumption for industrial purposes.

New York, N. Y., September 30, 1919.

INDUSTRIAL FUEL COMMITTEE,

MR. THOMSON KING, *Chairman.*

Gentlemen:

I have the honor to present herewith my report covering the period from November 1, 1916 to September 30, 1919. It is spread over this period because

no report has been made since the Atlantic City Convention of the National Commercial Gas Association in November, 1916.

A record of activities previous to November 1, 1916 may be found in the 1916 PROCEEDINGS of the National Commercial Gas Association.

Since the last report a number of new engagements have been secured in addition to many return calls received from situations having previously purchased the service. The following tabulation covers the field service from November 1, 1916 to December 15, 1917:

Name of company	Number of days
Utica (N. Y.) Gas & Electric Co.	10
Central Hudson (Poughkeepsie) Gas & Elec. Co.	6
Central Hudson (Newburgh) Gas & Elec. Co.	3
Rome (N. Y.) Gas & Electric Co.	12
Municipal (Albany) Gas Co.	8
Newport News & Hampton (Va.) Ry., Gas & Elec. Co.	5
Bristol & Plainville (Conn.) Tramway Co.	3
General Fire Extinguisher Co., Providence, R. I.	2
Malden & Melrose (Mass.) Gas Light Co.	1
Niles (Mich.) Gas Light Co.	5
Quincy (Ill.) Gas Elec. & Heating Co.	7
Eclipse Fuel Engineering Co., Rockford, Ill.	1
Goshen (Ind.) Gas Co.	1
Warsaw (Ind.) Gas Co.	1
Public Service Co. of Nor. Ill. (Chicago)	20
Lynn (Mass.) Gas & Elec. Co.	30
Rutland (Vt.) Ry., Light & Power Co.	4
Brockton (Mass.) Gas Light Co.	4
Old Colony (Mass.) Gas Co.	1
East Boston (Mass.) Gas Co.	2
Middletown Gas Lt. Co. (Conn.)	2
Peoples Gas & Electric Company (Oswego, N. Y.)	1
Penn. Central Lt. & Pr. Co., (Lewistown, Pa.)	10
Springfield (Mo.) Gas & Electric Co.	17
Port Arthur (Tex.) Gas & Power Co.	10
Beaumont (Tex.) Gas Light Co.	1
Indiana Fuel & Light Co., (Auburn, Ind.)	2
Indiana Fuel & Light Co., (Garrett, Ind.)	1
Indiana Fuel & Light Co., (Kendallville, Ind.)	1
Empire Gas & Elec. Co. (Auburn, N. Y.)	4
Providence (R. I.) Gas Co.	12
Northern Central Gas Co. (Williamsport, Pa.)	4
Sturgis (Mich.) Gas Co.	4
Allegan Co. (Mich.) Gas Co. (Allegan and Otsego)	2
Port Huron (Mich.) Gas & Elec. Co.	5
Fitchburg (Mass.) Gas & Elec. Co.	6
Rockland Light & Power Co. (Nyack, N. Y.)	1
Springfield (Mass.) Gas Light Co.	5
Kingston (N. Y.) Gas & Electric Co.	3
Mohawk Gas Co. (Schenectady, N. Y.)	1

The work consisted for the most part in making industrial surveys with recommendations for equipment to meet conditions where gas fuel might be used, and also inspection of special installations and sales of appliances. It is very difficult to give the results of these engagements in terms of new business

secured, because in many instances the time spent in each situation was so short that no immediate results could be expected. However, it is conservatively estimated that new business amounting to 40,000 cubic feet per hour, connected load, has been obtained by direct solicitation. Moreover, there has been a large amount of new business secured subsequently which has undoubtedly been brought about by the influence of the service.

Summary of time from November 1, 1916 to December 15, 1917.

Total calendar days	410 days
Sundays and holidays	67
Net working time	343
Time spent in field work	259
Total time at office and in travel	84

Percentage of working time spent in field—75.5.

With the approval of the Board of Directors of the National Commercial Gas Association, the Industrial Fuel Service was temporarily discontinued on December 15, 1917. This was done in order that the engineer of the Service might accept the position of resident engineer with The Koppers Company of Pittsburgh, in charge of the construction of light oil and toluol recovery plants for the U. S. Government in connection with war emergency operations.

On January 16, 1919, the Industrial Fuel Service was again resumed, under the direction of the American Gas Association, with the following engagements:

Rome (N. Y.) Gas, Electric Light & Power Company.

Four visits of one day each resulted in obtaining an order from the Rome Brass & Copper Company for gas equipment for five-tube brazing furnaces. Connected load, 2,000 cubic feet per hour.

Engineering advice was also given the Rome Wire Company in connection with fuel applications to a large battery of copper wire enameling ovens and an inspection was made of large gas fired annealing ovens.

The Spargo Wire Company has just placed an order for gas equipment for annealing copper wire, the connected load being 1,000 cubic feet per hour. This account was secured largely by means of the results obtained in other Rome factories where gas has been applied during the past two years.

Bristol & Plainville (Conn.) Tramway Company.

The Bristol Brass Corporation has added a connected load of 2,000 cubic feet per hour by installing gas equipment for brazing brass tubing.

The Wallace Barnes Company purchased a large japanning oven for baking japan on steel trouser guards. The connected load amounts to approximately 250 cubic feet per hour. Two visits of one day each were given to this situation.

Wilmington (Del.) Gas Company.

During May, June, July, August and September, a total of 37 days was spent in field work with the above company. A complete industrial survey was made of the manufacturing plants, new business was secured and inspections were made of existing industrial fuel installations. Two oven furnaces were sold to the DuPont Company for tool treating and die hardening, the connected load being approximately 500 cubic feet per hour.

Burner equipment was installed for heating singe plates in a cloth singeing factory, connected load 550 cubic feet per hour.

Experiments are now well under way for applying gas to the following equipment:

7—Core drying ovens
10—Brass melting furnaces—No. 60 crucible

16—Ovens for heat treating cork
3—Lithographing ovens

The results of these experiments are very encouraging and we expect to close the business shortly.

Philadelphia Suburban (Jenkintown) Gas & Elec. Company.

A visit of one day was required to investigate a heating problem in one of the industrial plants at Ambler. Final advice is pending the results of certain experiments in connection with driving CO_2 from carbonate of magnesia.

Summary—January 15, 1919 to September 30, 1919.

Total calendar days	258 days
Sundays and holidays	45
Net working days	213
Time spent in field service	45

Percentage of working time spent in field—21.1 per cent.

Steel Treaters Society

The writer attended the first Convention and Exhibition of the American Steel Treaters Society held in Chicago, September 23 to 27 inclusive.

This Society was formed about a year ago, and local chapters have been established in Cleveland, Pittsburgh, Milwaukee, Philadelphia, Cincinnati, Chicago, Rochester, Buffalo and New York.

I cannot too strongly recommend the advisability of industrial fuel men of the gas industry taking an active part in this organization. It is urged that they be particularly active in cities where no local chapter of the Society exists, in order that local chapters may be formed. Here is a wonderful opportunity to get the merits of gas fuel before the practical men of the steel industry.

Office Work

In addition to the above field work, assistance of considerable value has been given to thirty-two companies through correspondence. The inquiries in many instances have entailed considerable study and investigation before definite recommendations could be made. There has also been a considerable amount of office work in connection with problems encountered in the field service, which have required study and often interviews with manufacturers of equipment. Preparation of articles on industrial fuel subjects for the A. G. A. MONTHLY, compiling of statistical data and other miscellaneous details have occupied the time not given to field duty. Some preliminary work has been started in the way of preparing articles for the trade journals on the application of gas to industrial heating operations. It is expected to have articles dealing with core drying and brass melting ready for publication shortly.

Cost Data

At the request of Mr. H. Vittinghoff, Chairman of the Sub-Committee on Cost Data, blanks were mailed to all of the 550 company members of this Association together with a letter requesting that they send in reports on installations in their respective territories. To date we have had a very few returns. Nine companies acknowledged the request, saying they had no industrial installations to report on.

Six companies have turned in reports as follows:

Name of Company	Report on
Public Service Co. of Northern Ill.	Core Drying
Public Service Co. of Northern Ill.	Forging Steel Blanks
Peoples Gas Lt. & Coke Co.	Hardening Mower Blades (2 reports)
Municipal Gas Co. (Albany)	Core Drying
North Westchester Lighting Co.	Burning on Battery Terminals
North Westchester Lighting Co.	Welding and Annealing Wire
St. Paul Gas Light Co.	Cleaning and Drying Garnet and Sand
Pawtucket Gas Co.	Steam Boiler Installation for Heating Solution Tanks in which Metal Rolls are Dipped for Cleaning.

Conclusion

If the Industrial Fuel Service as herein represented can be assumed to indicate generally the interest taken by gas companies in their industrial business, it is obvious that more interest and activity existed in the gas fraternity in this respect before the war than has been manifest since the armistice.

It is hoped, therefore, that those who manage the affairs of gas properties may realize the great possibility for selling gas for industrial uses and take advantage of the service offered by the Association.

In view of the tentative plans outlined by the Advertising Section, it is believed that the Industrial Fuel Engineer can be of much assistance in the preparation of articles for publication in the popular technical and trade press, to promote more general interest and produce a bigger market for gas. It is, therefore, recommended that a part of his time be devoted to the above work.

Respectfully submitted,

(Signed) W. A. EHLERS,
Industrial Fuel Engineer.

Texas Company Decides For Gas

A great many gas men will say that fuel oil is one of their strongest competitors in the industrial fuel field, especially when it is sold at the very low pre-war price. This fact does not seem to be upheld by the experience of the Texas Company.

A short time ago our Mr. Ehlers was requisitioned to make an examination and report on the fuel equipment in the case and package plant of the Texas Company at Port Arthur, where gas from the local gas company was being used in large quantities.

On account of unavoidable difficulties, the service at that time was not quite up to the standard and the Texas Company was considering various means of replacing the gas with other fuels. After a careful survey and several interviews, the manager of the case and package plant was convinced that the gas was being used very inefficiently, but that no other available fuel could give the service required by the exacting methods of the heat application in his plant.

We now learn from an authoritative source that the Texas Company has accepted Mr. Ehlers' recommendations, and has placed an order for a complete change in the utilization of gas in the plant. The Company has purchased a single valve air-gas system with entirely new burner equipment for all of its gas consuming appliances.

The above situation shows the very strong position which gas holds among its competitors for fuel purposes, even where oil, gasolene and kerosene are available at a very low figure, for this Texas Plant is situated within a few hundred yards of the refinery of the Texas Company where quantities of its own fuel products are available.

It clinches the fact that where service, simplicity and saving are concerned, there is no other fuel comparable with gas.

Standard Performance Specifications for Gas Furnaces

HOW CAN THEY AFFECT YOUR BUSINESS?

AT the Friday morning session of the Commercial Section at the First Annual Convention of the Association, the Sub-Committee of the Industrial Fuel Committee, on Standard Performance Specifications for Gas Appliances presented its report.

Two facts were immediately evident. The report covered a subject and contained suggestions that are of sufficient concern to every gas man, manufacturer of gas furnaces and user of them, to merit an immediate and thorough consideration. If the standards to be determined are made up according to a scientific plan and a correct technical understanding of what characteristics of a furnace affect its operating results, as well as what results are to be desired, the standards will prove of great value to the industry. The standards themselves, the methods of arriving at them, the system of expressing or recording them and the tests whereby it is determined whether a specific furnace conforms to them, are all of the utmost importance.

To be sure that the best decisions had been made in each of these cases, the report needed thorough discussion by all industrial fuel men, and it was evident that the possibility of such discussion and the time for it were both lacking; the report was abstracted for the benefit of the members present. The printers' strike had prevented the distribution of advance copies as had been planned. Then the very lateness of the day and hour made it impossible to secure expressions of opinion from all the men still in attendance. To meet the situation, however, a motion was made and carried that Mr. Lundgaard's report be printed in full in this issue of the MONTHLY and that every member of the Association and all readers of the MONTHLY be urged to send their written approval or disapproval of the report to Association headquarters.

If the wrong standards, or standards made up on a mistaken basis are put into effect, the damage will be beyond measure and may seriously affect the industry.

We can be assured of correct standards and correct methods of determining them only if all those interested, give the Committee the benefit of their opinions and experience. *Read this report now and send your discussion of it to headquarters at once.*

Industrial Fuel Committee Report of Sub-Committee on Standard Performance Specifications for Gas Appliances

I. LUNDGAARD, Sub-Chairman

THE purpose of standard performance specifications is to establish a rigid procedure for testing and reporting facts pertaining to the operating performance of any apparatus. Such standard performance specifications have long been established and in use for the testing of boilers, steam engines, gas engines, electric motors, generators, transformers and many other devices in general use, but specifications for testing most gas consuming devices are not yet available.

The absence of performance specifications and the attendant lack of reliable information as to performance of the various devices built and marketed, is largely responsible for the generally low standard of efficiency of apparatus commercially available, and for the great difficulty experienced in marketing high grade devices in competition with cheaper goods whose merits are not made known to the purchaser. Clear statements of pertinent facts regarding the performance of various gas furnaces offered for any purpose will enable the purchaser to judge the relative value, for his purposes, of the proposals received. The furnace manufacturer who finds that the relation between the economy of his furnace and its price makes it unsaleable is quickly forced to adopt new characteristics for his furnace. The manufacturer who at the present time attempts to sell high quality finds it almost impossible to get a price corresponding to the cost and the merit of his goods, as there is no well defined method whereby he can demonstrate and guarantee the superior quality of his furnaces, and within limits, there is greater profit in marketing goods of inferior quality. Thus a premium is paid to the manufacturer for low efficiency and no encouragement is held out for effort in the direction of improved performance.

The essential characteristics of standard performance specifications may be outlined as follows:

1. No restriction must be placed on construction features, as it is in no sense the purpose of performance specifications to set up standards for apparatus design and manufacture or to limit the manufacturer in the full and free exercise of his ingenuity and resourcefulness in the making of designs or the use of materials. Only such minor construction features as are necessary for the observation of performance under the standard specifications, such as pyrometer holes, etc., may be required to be made in conformity with these specifications.

2. Standard performance specifications must clearly and definitely cover methods and, when necessary, means of observation of such facts as, under stated conditions, have bearing upon or actually show the efficiency of operation of a device and a method of stating the capacity of the device in accordance with suitable standard rules. The tests required under these specifications should preferably be so simple as to make it possible for a purchaser closely to check by simple means the performance of a device, but they must be rigid enough to allow no doubt as to the facts in case sufficient pains are taken in the execution of the performance tests. Only such facts as

are of practical value need be covered under standard performance specifications.

3. It must be clearly understood that such performance specifications as do not cover construction features and as are prepared to enable the manufacturer to state and, if so disposed, to guarantee certain features of efficiency under stated conditions, cannot be used for the protection of the purchaser or the manufacturer beyond the features dealt with in the specifications.

4. Standard performance specifications must have the approval of the American Gas Association and be adopted by the manufacturers of the devices covered by such specifications.

5. A standing committee of the American Gas Association should be in charge of the further preparation of and future modification of performance specifications and should be available for service to manufacturers and purchasers alike in the introduction and application of the established standards as well as in the settlement of disputes that may arise with reference to their interpretation and use.

PRELIMINARY REPORT ON STANDARD PERFORMANCE SPECIFICATIONS FOR UNDERFIRED OVEN FURNACES

The Committee has prepared a tentative proposal for standard performance specifications for oven furnaces, which is submitted for consideration. The work of the Committee is only a start and continuance is urged, but the present report involving the initial steps toward an important end should be given the closest attention by those interested, in order that the whole matter may be placed on a sound foundation. There is at the present time not even a general recognition of the features of furnaces that must be dealt with in the proposed specifications; thus the first part of the Committee's work consisted in determining what attributes of the operation of oven furnaces could be best used to determine its operating merits. The following are proposed:

1. Space rating.
2. Normal operating temperature.
3. Normal fuel consumption.
4. Calorific capacity at normal operating temperature.
5. Open-door temperature.
6. Maximum gas consumption of the furnace, and gas and air pressures required for this consumption.
7. Maximum temperature of operation.

The above does not include a load test of the furnace but no satisfactory means of making this test has yet been found. It is true that in most cases the consumption under load, of different furnaces, is practically variable only with respect to the wall losses so that the no load test is sufficient indication of the relative efficiencies of different furnaces. In regard to recuperative furnaces, however, and in general, in all cases where the heat of the exhaust gases is utilized to a greater or less extent, the operation under load becomes of greater importance and it is believed desirable to establish a standard load test.

DEFINITIONS

The following definitions apply to the items enumerated above:

1. Space rating.

The space rating of an underfired oven furnace is to be a statement of the hearth area that is actually underfired and available for load and the average height of the heating space immediately above this area. The space rating of the furnace shown in Fig. 1 is thus 12″ x 16″ x 6½″.

2. Normal operating temperature.

The normal operating temperature is that stated by the furnace manufacturer

as the temperature at which the furnace is designed normally to operate and for which data are given under Definitions 3, 4 and 5. This temperature is to be observed in the stereometrical center—that is, the center of gravity of the heating space defined under 1. Furnaces must be equipped with openings so that this temperature can be taken.

3. Normal fuel consumption.

By normal fuel consumption shall be understood the B. t. u. per hour required to maintain normal operating temperature after complete heat balance has been reached.

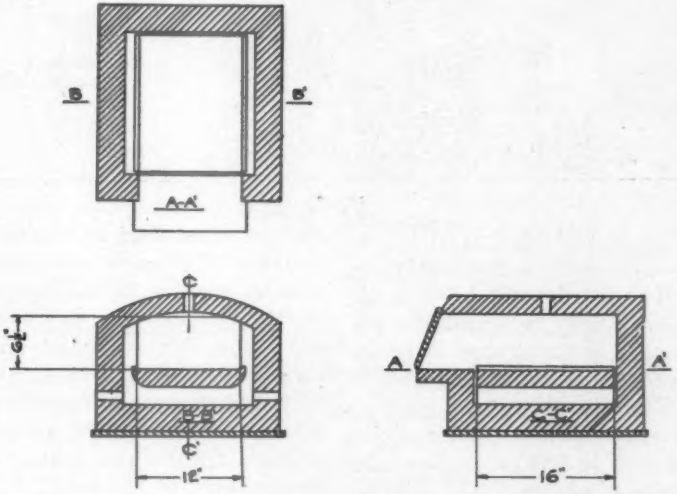


FIG. 1 - SHOWING SPACE RATING

4. Calorific capacity at normal temperature.

The calorific capacity at normal temperature is the B. t. u. required to heat-saturate fully the furnace at normal temperature and is determined as described under tests.

5. The open-door temperature.

The open-door temperature is the temperature observed in the stereometrical center of the heating space when normal fuel consumption is supplied and the heat balance is reached with the furnace door wide open.

6. Maximum gas consumption.

The maximum gas consumption for which the furnace is designed and the air and gas pressures required for operation at this consumption.

7. Maximum temperature.

The maximum temperature is the highest temperature registered in the center of the heating space, to which the furnace may be brought with safety to all parts.

UNITS OF MEASUREMENT

Dimensions.

Metric or English units may be used.

Heat Units.

The gross heating value of gas shall be used and may be stated either in metric or English units.

Temperatures.

Degrees Fahrenheit or Centigrade.

Gas.

Cubic feet or cubic meters referred to 30" barometric pressure, 60° F. or 760 mm. barometer and 15° C. respectively.

Pressures.

Height of water column or any other stated unit of measurement in metric or English units.

INSTRUMENTS FOR TEST

All instruments subject to calibration must be calibrated before and after the test.

Any instrument of proven accuracy may be used.

Type and make of instruments used shall be described in the test records.

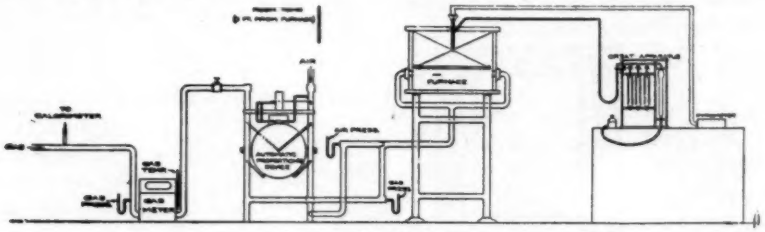


Fig. 2.

TESTS

The furnace shall be thoroughly inspected before tested, and if defective, all defects found shall be remedied. No effect of faulty condition shall be recognized as part of these standard performance specifications.

The arrangement and placing of instruments shall be left to the ingenuity of the engineer, who must take pains to install all instruments so as to get accurate results.

The following observations are to be made:

1. Barometric pressure.
2. Room temperature.
3. Temperature of gas.
4. Gross heating value of gas.
5. Gas consumption.
6. Furnace temperature.
7. Flue gas analysis.
8. Gas pressure between controlling valve and furnace.
9. Air pressure between controlling valve and furnace.
10. Kind of gas; carbureted water, coal, natural, et cetera.

The general arrangement for test is shown in Fig. 2.

The furnace shall be operated with maximum gas consumption until normal operating temperature has been reached, after which the gas shall be reduced while normal operating temperature is being held until heat balance has been reached as indicated by the fact that the heat input for temperature maintenance remains constant. Heat balance shall then be maintained for two hours; after which the door is thrown open while normal heat input is being continued until heat balance has been reached as indicated by the fact that the open-door temperature remains constant for not less than one-half of one hour.

Only such adjustments of dampers and burners as are automatic and part of the equipment under test may be made when changing from closed door to open door test. Automatic means for maintaining ratio between gas and air may be employed.

All observations shall be made in regular order of routine and at 10-minute intervals except that flue gas and calorimeter determinations may be made every 20 minutes, provided the quality of gas is not subject to rapid and substantial fluctuation. Furnace temperature shall

be relative to room temperature. The cold junction of the pyrometer end shall, therefore, be at room temperature and its zero point referred to this temperature.

Calorific capacity shall be determined as follows:

Deduct from the total heat consumption up to the time of completing a two-hour period of normal temperature heat balance with normal heat consumption, an amount of heat equal to the normal heat consumption for the total time elapsed since the beginning of the test; for example:

Total time to end of period of normal heat balance.....5 hrs.
Total heat consumption....540,000 B. t. u.
Normal heat consumption...69,000 B. t. u. per hour
Normal heat consumption for 5 hrs.....345,000 B. t. u.
Calorific capacity 540,000—345,000.....195,000 B. t. u.

REPORT

The report of the test shall be made on a standard form, as shown on Figures 3 and 4, and all information for which space is provided, shall be furnished.

CURVES

To show consistency and continuity of observation, curves shall be plotted as shown in Fig. 5.

FURNACE NAME PLATES

The following information shall be given on furnace name plates:

Name of manufacture.

Trade name of apparatus and other suitable items of advertisement and information that the manufacturer wishes to include.

Type of furnace .....
Heating space .....
Door .....
Kind of gas .....
Normal temp. .....
Maximum temp. .....
Maximum gas con. .....
Air pressure .....
Calorific cap. .....
Gas pressure .....
Open door temp. .....
Normal heat consumption .....

STANDARD PERFORMANCE SPECIFICATION
FOR
GAS FURNACES
REPORT OF TEST

MANUFACTURER _____ TYPE OF FURNACE _____
KIND OF GAS USED FOR TEST _____ HEATING VALUE OF GAS _____
HEATING SPACE _____ DOOR _____
MAX. TEMPERATURE _____ NORMAL TEMPERATURE _____
MAX. GAS CONSUMPTION _____ GAS PRESSURE _____ AIR PRESSURE _____
CALORIFIC CAPACITY _____ NORMAL HEAT CONSUPTION _____ OPEN DOOR TEMPERATURE _____

INSTRUMENTS USED FOR TEST

OBSERVATION	MAKE	TYPE	UNIT OF REGISTRATION
BAROMETRIC PRESSURE			
ROOM TEMPERATURE			
TEMPERATURE OF GAS			
GROSS HEATING VALUE OF GAS			
GAS CONSUMPTION			
FURNACE TEMPERATURE			
FLUE GAS ANALYSIS			
GAS PRESSURE			
AIR PRESSURE			

DATE OF TEST _____ TEST MADE BY _____
LOCATION _____ WITNESS _____

Fig. 3.

PERFORMANCE TEST OF GAS FURNACE											Sheet No.						
											Date						
No.	Time	Gas-meter reading	Gas registered	Barometer	Gas pressure at meter	Gas temperature at meter	Corrected gas cons.	Gross heat value of gas	Heat input	Temperature		Pressure at furnace		Flue-gas			REMARKS
										Room	Furnace	Gas	Air	CO_2	O_2	CO	

Fig. 4.

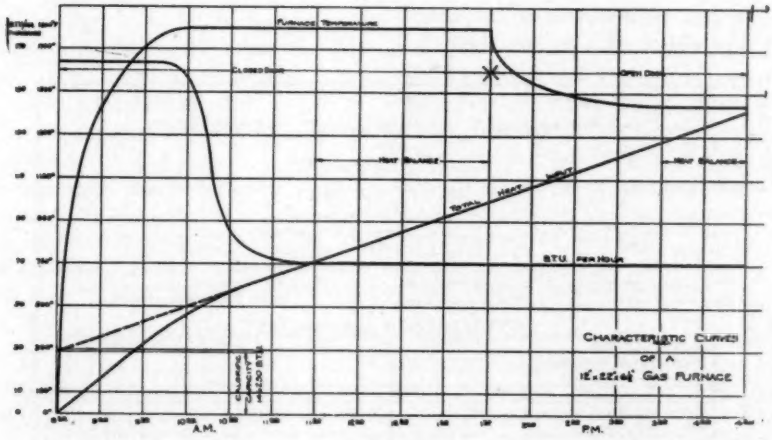


Fig. 5.

APPENDIX

In proposing the use of heat content of gas for measurement of heat input to the furnace, it is realized that the nature of the gas will influence its efficiency but factors of correction as between various kinds of artificial gas and natural gas, for instance, may be established. The ideal situation would undoubtedly be to have a standard gas for the purpose of making these tests, but such a gas, if de-

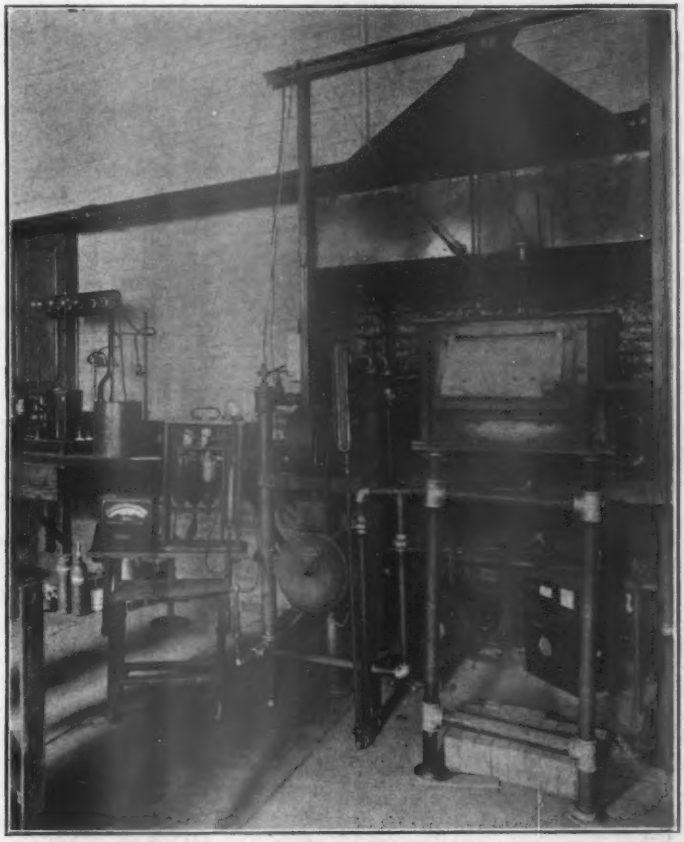


Fig. 6.

termined upon, would probably not be universally available. It is recommended that the Committee make a study of the relative efficiency of various gases commercially used and establish correction factors that may be applied to results obtained by tests with different gases.

In order to test the feasibility of the proposed performance specifications, the Committee had erected at the laboratory of the Rochester Railway & Light Co. the testing equipment shown in the diagram, Figure 2, and further illustrated by photograph, Fig. 6. Tests were run which showed that quite consistent results may be obtained under the proposed specifications. Details of these tests are not submitted as they have no practical interest outside of their value in guiding the Committee in the work of establishing the standard performance specifications proposed herein.

The Committee wishes to acknowledge and express its appreciation for the loan of apparatus from the Rochester Railway & Light Co., the Taylor Instrument Co. and the Ratiometer Corporation, all of Rochester, N. Y.

Special Sales Campaigns

READY FOR IMMEDIATE USE

WHEN Mr. H. K. Dodson, subchairman of the Sales Development Committee on "Special Sales Campaigns" presented his report to the American Gas Association Convention on Tuesday afternoon, October 14, he began with the following emphatic introduction:

"The prime object of special sales campaigns is to stimulate activities, to arouse the interest of our customers, and to bring our goods forcefully to their attention. A successful sales campaign requires organized, concerted action. It must be well planned in every detail, and must be heartily supported by interallied departments, particularly the publicity, advertising, floor and window display and installation departments. * * *

"It is easy enough to follow the road that offers least resistance and pick the fruit within easy reach, but continued drives and strenuous efforts through special sales campaigns prove of inestimable value. * * *

"Your Committee believes that the 'hit and miss' methods of former years should be abolished, that specific dates should be established for the inauguration of definite sales plans, and that such plans should be prepared well in advance of their development."

The report then proceeded to give a definite schedule of twelve special campaign weeks, one for each month of the year.

It was the Committee's opinion that while these twelve weeks should receive the special and concentrated attention of the commercial department, the value of the other forty weeks should not be left to chance. The opportunity is offered for well planned and persistent endeavors to follow-up previous sales and to present, according to the general merchandising policy of the company and the resources of its commercial department, demonstrations, general arguments for gas service, exhibitions of work done by gas, and other indirect but equally effective aids in selling the company's product.

In accordance with the Committee's idea for thus planning commercial activities for the whole year in advance, the following schedule was arranged.

What Companies Shall Adopt the Schedule of Twelve Campaigns?

This question can be answered only by an all-inclusive word. The schedule increases in value for each individual company as gas companies in other territories adopt it and a result equal to a national campaign is produced. When gas companies throughout the United States are staging special sales on modern laundries during one week of May, manufacturers of laundry equipment will be in a position to supply to the retail dealers sales helps and advertising aids which have a national significance in attracting the attention of the prospect. Perhaps the most convincing analogy that can be suggested is the case of "White Sales" by department stores or of "Gift Sales" in June. The force of the national tie-up of selling effort is also demonstrated

(Continued on page 636)

Sales Schedule For Twelve Months

Recommendations for special sales weeks	Suggestions for activities for other weeks during the year
January	
1st week—CLEARANCE SALE	
2nd week—	Baking demonstrations—Bread
3rd week—	Baking demonstrations—Pies
4th week—	Baking demonstrations—Cakes
February	
1st week—GAS ROOM HEATERS (Also Sept.)	
2nd week—	Architects', Contractors', and Builders' Exhibition
3rd week—	Cake griddles
4th week—	Stove oil or Rustoff
March	
1st week—GAS RANGES	
2nd week—	Broiling
3rd week—	Convenience of hot water
4th week—	Hygiene of hot water
April	
1st week—GAS WATER HEATERS (Also July)	
2nd week—	Boiling
3rd week—	Waffle irons
4th week—	Comparative cost of gas, coal and other fuels
May	
1st week—ALL GAS KITCHENS—RANGE, WATER HEATER, ROOM HEATER, Etc.	
2nd week—	Cooking utensils
3rd week—	Oven dinner cooking
4th week—	Gifts for the June bride
June	
1st week—MODERN LAUNDRIES — GAS IRONS, MANGLES, LAUNDRY STOVES, CLOTHES WASHERS, AND DRYERS	
2nd week—	Boiling clothes
3rd week—	How to care for the water heater
4th week—	Preserving and canning demonstrations
July	
1st week—GAS WATER HEATERS (Also April)	
2nd week—	Three-piece set saucepans
3rd week—	How to care for the gas range
4th week—	Sad iron heaters

August

1st week—GAS STOVE LIGHTERS	
2nd week—	Solid top to gas range
3rd week—	Toasters
4th week—	Fire place gas heaters

September

1st week—GAS ROOM HEATERS (Also Feb.)	
2nd week—	Reasons for variations in customers' gas consumption at different seasons of the year
3rd week—	Housepiping
4th week—	Lamp shades and reflectors

October

1st week—GAS LIGHTING	
2nd week—	How to care for gas lamps
3rd week—	Commercial gas lighting
4th week—	Gas table lamps

November

1st week—GAS LIGHTING FIXTURES	
2nd week—	Store lighting
3rd week—CHRISTMAS GIFTS	
4th week—	Christmas gifts

December

1st week—	Christmas gifts
2nd week—	Christmas gifts
3rd week—	Christmas gifts
For the four odd weeks in the year	SERVICE

clearly in the article on page of this issue, which describes the success of the Columbia Graphaphone Company.

Encouraging Gas Companies to Adopt the Schedule

The great value of having the year's routine of sales definitely pre-determined must be evident to every salesman. Under this system the appropriation for sales activities can be adequately fixed, the sales force for carrying on the work can be permanently maintained on a profitable basis, and the campaigns can be laid out in the detail and with the care that will insure their success.

The Association, influenced by the opinions of representative gas men as expressed in the discussions at the Convention and through other mediums of communication, has decided to aid in every possible way the efforts of the 1920 Sub-Committee on Sales Campaigns to secure the adoption of the schedule. The Advertising and Manufacturers Sections of the American Gas Association will lend their support to the success of the plan. The former will be in a position to prepare appropriate advertising copy for use in newspapers, magazines and folders and to make suggestions for window trims and floor displays to suit each campaign. The Manufacturers Section will direct the advertising and publicity efforts of its members into lines which will suit in subject and date, the schedule as planned.

The Association MONTHLY will make every effort to publish, in addition to the suggestions of the Advertising Section, an interesting article on the special sale listed for the subsequent month. A

number of this series of articles have already been promised by men prominent in the gas industry and they will give definite plans and workable ideas for the conduct of the campaign from day to day. Suggestions, outlines of plans that have been used in past sales, photographs of window trims or floor displays will all be exceedingly welcome at Association headquarters and full credit will be given for such materials.

In Mr. Dodson's words "This schedule of Special Sales Weeks puts into effect a policy that we have been trying for years past to establish—*i. e.* the preparation of sales plans far in advance of their development. We believe that a great deal can be accomplished if the gas company members of the Association will adopt the plan, and follow out its suggestions as they relate to important subjects which should be brought to the attention of gas consumers more forcefully than ever before."

Gas In the Printing Craft

ONE of the operations which the American Gas Company in its Western Division has added to its lines again and again, is the heating of matrix tables in printing shops, by means of gas-fired boilers.

A matrix, or "mat," as it is called, is made of several thicknesses of special paper glued or pasted together. This damp and pulpy substance is placed over a form of type or cuts and by pressure it receives an exact impression of the matter to be reproduced. The paper impression must then be made "bone" dry so that hot metal can be poured over it and allowed to harden in the desired form of type or cut.

Mr. Harry L. Wolfe, Industrial Gas Engineer of the American Gas Company, Western Division, who has furnished the information for this paper, has found that the 2-section Goss matrix table is most frequently used in the towns where a daily paper is printed. The installation calls for a three-horsepower, 18-inch shell, short type gas-fired boiler which fits in particularly well because of the small space it occupies and the direct and constant control which the operator can exercise. (See Fig. 1.)

The boiler is lighted about 30 minutes before the table is to be used, and the condensation from the drying mats is returned directly to the boiler, a feature made possible by the low water line in the latter. A steam pressure of 60 to 80 pounds must be maintained and the average cost in such installations has been found to be about 50 cents a day. Furthermore, no cost for a boiler attendant is incurred.

The following data, as submitted by Mr. Wolfe, will explain conditions in a medium sized newspaper plant.

Record of gas consumption on an 18-inch boiler used by the *Decatur Daily Review*. The boiler is connected to a two section Goss matrix table. For five day a week, about 13 to 17 matrixes are dried per day; on Saturday, about 25 to 30.

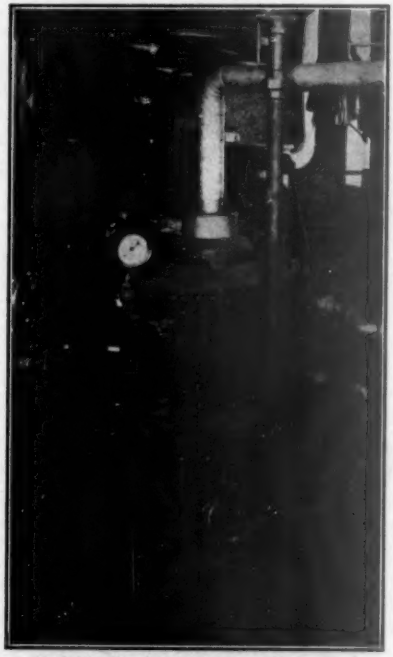
No. Hrs.	No. Ft.	Average per hour	Dates
6.00	775	129	Dec. 21
5.50	725	126	" 22
5.40	725	126	" 23
3.55	500	124.87	" 24
3.50	525	131	" 25
2.30	350	140	" 26
3.45	575	153.75	" 27
3.35	500	151.50	" 28
3.50	525	152	" 29
4.00	550	137.50	" 30
3.40	500	136.50	" 31
5.20	700	127.50	Jan. 1
3.40	500	133.33	" 2
3.45	625	166.66	" 3
4.30	700	155.50	" 4
3.45	575	153	" 5

Sometimes a special gas-heated drying cabinet is used to dry the mats partially before they are pressed over the original form, only enough moisture being retained to make it possible to get an impression of the type on the paper. The final drying is then done on the matrix table.

Stereotype Melting

A special metal made of about 80 per cent. lead and 20 per cent. tin and antimony, is used to translate the impression on the mat back into metal again. This is known as stereotype metal and gas-fired pots are needed to melt the mixture originally and re-melt the forms and slugs after they have served their purpose.

Mr. Wolfe's experience leads him to believe that blast burners, assisted by atmospheric burners, are the most efficient and practical for this work. In Mr. Wolfe's own words: "An atmospheric burner alone is too slow and consequently more expensive. At the *Peoria Journal* plant, Peoria, Ill., we made a saving of 25 per cent. by changing a straight atmospheric burner installation to blast and using a small atmospheric burner to warm the pot before turning on the blast burner equipment, which consisted of a three ring burner and fan blower. We also left a small flame over night under the pot. The following data on a blast installation for a daily paper in a town of 25,000 inhabitants show a gas consumption of only 1 foot of gas for 5 pounds of metal at 550° F.



Boiler heating Goss 2 Section Matrixtable
(coal boiler displaced at extreme right)

" 'The printers succeeded in melting 3,000 pounds of metal on 600 cubic feet of gas. The metal was kept in a molten condition at a temperature of 550° F. for a period of four hours with a consumption of 200 cubic feet of gas. This same consumption also melted about eight additional pigs for the four hour period or about 400 additional pounds of metal.

" 'The fire is started at 11.00 A. M. and the pot is slowly heated to a temperature of 550° F. This operation takes from one and one-half to two hours. It is better to heat metal gradually rather than to push the fire. The pressman be-

3 HP. Boiler heating Goss 2 Section matrixtable and dross melter

gins casting at about 1 o'clock and continues the operation until 4:00 P. M. each day. The average daily consumption runs a little over 800 cubic feet due to the fact that between Saturday and Monday, the metal freezes. The gas used for this purpose costs 90 cents per M. cubic feet or between 70 cents and 80 cents per day.'"

The great advantage of gas lies in its ready control. A coal fire frequently overheats the pot and the result is the oxidation of the surface metal which thus forms a scum that must be removed and can only be sold as junk. Moreover, since the more expensive ingredients of the mixture, tin and antimony, float on the surface of the lead because of their specific gravity, the oxidation of the surface is a doubly expensive matter. By using gas and preventing this disastrous overheating, a saving is effected that more than pays for any difference in first costs of fuel.

The mixture must be well stirred up before it is pumped out and this is done by introducing into the pot a dry potato on the end of a rod.

The small amount of dirt and dross found in the original mixture is skimmed off and put at once into a dross melter (see Fig. 2), into which is also dumped the large amount of foreign matter skimmed from the pot when old slugs and type are remelted. An average of 80 per cent. useable metal can be recovered from the dross melter, which is heated by an atmospheric burner that can raise it to a high temperature. The pure metal is drawn off in ingots from the bottom of the pot.

Gas to Drive Out Static Electricity

In job printing offices, Mr. Wolfe has also found good prospects for gas-fired glue heaters and for burners to drive out static electricity. It appears that on rapidly moving presses some force develops which causes the printed sheets to adhere to the printing plates. A ¾-inch pipe burner with an oversized air mixer is suspended horizontally across the printing press and gas is supplied to it through a hose. The port holes are small and the heat is thus applied under the printed sheets as they come from the press. This drives out the static electricity which causes the adhesion spoken of, and prevents sticking.

Mr. Wolfe, in closing his remarks, writes—"Our experience in installing various appliances for the printing craft, has been that an installation has never been removed and that is the best proof that it is perfectly safe to guarantee results to your customer."

Boiler for heating wax kettles and glue pots; also drying cabinet

Window Displays that Repeat the Story

WHICH affects the passerby more favorably—the window display that presents a new idea or the one that tells the old story again? I suppose nine out of ten men would vote at once for the new idea, unless they happened to be ten men who had given some serious thought to the subject or gathered some actual facts from experiments.

If, however, one gets the question clearly in mind, it soon becomes evident that there is really no question to be answered, for where will you find your really new idea for selling any product, for instance, gas and gas appliances

How many readers really know that the "Duchess" wrote only one story, for she retold it in unnumbered volumes to the delight of all sentimental sixteen-year olds and of many of their elders. The old story remains. The newness comes only in the form or manner or size of its retelling.

There is, however, a little more subtelty to the question than this. When a window trimmer pauses to plan his new design, which shall he let the passerby see—that his story is the same story he has been telling since Murdock's day, or that his display has a newness and freshness that promises something special?

That all depends. The passerby, we know, remembers only what has been told him again and again. Say it often enough, in words or pictures, and he will not only eventually remember it, but he will be convinced of its truth. On the other hand, he pauses to listen, or to see, when he thinks he has found something new.

The conclusion must be, put all the newness you can into the make-up of your display and, every now and then, remind your audience that after all it's the same good story which they have heard before—so good that it's worth repeating.

Effective Method of Repeating

Perhaps the most effective method of repeating the advertising of a company, is to tell the same story in more ways than one at one time. In other words, make a tie-up between window displays and newspapers.

In the Aug. 14 issue of *Printer's Ink* S. E. Kiser tells how the Columbia Graphophone Company has worked out a monthly tie-up that is nation-wide. The fact that the company's business for eight months of 1919 showed a vast increase over that of any previous year can not be attributed entirely to the advertising plan, but a definite connection between them has been established.

Mr. Kiser writes in part as follows:

"Even if information concerning the rapid sales growth were lacking, the enthusiasm with which dealers have adopted and are promoting the ideas embodied in the tie-up between the national advertising and their store and window displays would be a sufficient indication of its success. Indeed, it would be difficult not to believe that such a co-ordination of effort would bring encouraging results quickly. The logic of it is so obvious as to make one wonder how it ever happened to be overlooked. It would seem as if the first national advertiser who ever distributed dealer helps ought to have recognized the advisability of disposing his two forces in such a manner as to make them work together. They comprise his artillery and infantry. To use each separately, neither depending upon or supporting the other, is as illogical as it would be for the commander of an army to let the two main elements of his fighting force operate at their

own convenience, each in its own way and without reference to the activities of the other.

"Because of the thoroughness with which the tie-up that is being discussed has been worked out and is executed month after month, it may not be unprofitable to consider it in detail.

"When Mr. Average Citizen opens the latest number of his favorite magazine he sees the Columbia Graphophone Company's advertisement, probably in colors. He may not have time to read it, but if he doesn't, the advertisement has not been wasted on him, because he will find it at his plate when he sits down to breakfast the next morning. On the cover of the 'Columbia Supplement,' an attractive booklet issued once a month, the illustration accompanying the current advertisement is reproduced, and an effort is made to have a copy of this booklet go by mail to every owner of a Columbia Graphophone and every prospective purchaser of a record.

"On his way to business Friend Citizen, glancing through his newspaper, gets another look at the illustration that he saw first in his magazine and then on the cover of the booklet at the breakfast table. By this time it is probable that he is becoming pretty well acquainted with it, so that when he sees the same thing, nicely set up in the dealer's store window, as he is passing on the way to his office, he recognizes it immediately.

"It is probable, too, that he will see beside it in the window, the latest record, mounted attractively and accompanied by a picture of the artist who is being featured. A half dozen words, printed in large type upon an interesting card that is a part of the special mounting device, will explain the nature of the record, so that the prospect gets the message the advertising is intended to convey, whether he is conscious of a desire to receive it or not. It is presumed that by this time he will be inclined to make an inquiry, and when he steps into the record booth he sees the magazine illustration again, this time upon the artistic hanger that goes out every month as a part of the dealer service. Here is a tie-up that seems to be complete. Not one loose end is left to dangle anywhere. Not a sign of a broken connection is to be found between the advertisements and the actual 'goods' in the dealer's store.....

"Frequently the connection between the magazine or newspaper advertisement and the dealer's store is so slender as to be practically unnoticeable. Several years ago, to cite an instance, a Western manufacturing company that had inaugurated a national advertising campaign produced a window cut-out modeled after an illustration in one of its monthly advertisements; but it was not ready for distribution until long after the illustration by which it was suggested had been published and perhaps forgotten.

"Furthermore, it was intended to serve as a 'stock piece,' to be exhibited at the dealer's convenience and without reference to the advertiser's current display in the magazines. Consequently there was no actual tie-up at all, and only a few of the dealers to whom the cut-out was shipped could be induced to display it. The piece was big, elaborate and expensive, but it served about the same purpose that would be served by a circus poster that was put up after the circus had left town. It would be easy enough to mention many similar instances of failure, because of misdirected effort, to utilize an advantage that had the prime essential of simplicity.....

When asked whether any difficulty was experienced in getting dealers to perform their part in making the tie-up between the national advertising and window and store display effective, Mr. Tuers (of the Columbia Co.) said:

" 'It will be easy enough to understand the attitude of the dealers when I explain that they are paying for the sales helps that go to them. They do this by subscribing for one dealer service, a flat rate being made to all, just as if they were subscribing for a newspaper or a magazine, or for a regular service of any other kind. This rate is fixed to cover the cost of the service provided, and no more. It is not intended to produce any profit for the company, except through increased sales. I should say that 70 per cent. of our dealers are making regular use of the service.'

"Mr. Tuers was reminded of the difficulties that some advertisers have had in getting dealers to make use of window cut-outs, particularly where several different kinds of products are handled and where two or more producers furnish displays to be set up at the same time.

" 'We have no trouble of that kind,' he said. 'In the first place, as I have explained, the dealer pays a subscription price for the service of which the window cut-out is a part, so that he is no more likely to disregard it than he would be to toss away unopened a magazine for which he was paying by the year; but there are other reasons why Columbia dealers make regular use of the window cut-out and other

pieces that we place at their disposal. We don't try to overdo a good thing. Our cut-out is kept small enough to be handled easily. When the dealer has it set up in his window it doesn't darken the whole store or occupy all the space at his disposal.

"'There is another thing that should be kept in mind. Our window displays are made in units that may be used separately or in the full combination, according to the dealer's convenience. The cut-out reproducing the illustration in the national advertisement constitutes one unit. Then there is the record-stand, which makes up an attractive window-piece in itself, and the other features are arranged in the same way for separate display or for a full window trim, with the cut-out as the centerpiece. For these reasons, the dealer utilizes our window cut-outs regularly, as well as the rest of the materials that are furnished to complete the tie-up between his store and the Columbia advertisement in the national publications. But there is an additional use for which these dealer helps are intended. With each set we furnish a container, so that the dealer may keep a complete file. Frequently our monthly campaign features some singer or other artist. If later that particular artist is billed for a concert or any other kind of an engagement in any particular dealer's town, he has our window cut-out, the record-stand and other materials with which to make a special window display.'

"The Columbia company is an organization of tremendous proportions and of far-reaching resources; but there is no reason why the use of such a tie-up plan as it has evolved should be limited to big advertisers. Long ago wide-awake dry goods merchants learned that there was an advantage in making a connection between their window displays and their local newspaper advertising.

"If, for instance, they ran advertisements concerning street gowns it was found to be profitable to make window displays of such gowns, and so on all through the various lists of their merchandise. To make the tie-up national, instead of merely local, it is necessary only to have a definite policy and to adhere to it consistently. There would seem to be no reason why the advertiser whose product is marketed by 500 dealers may not bring about a co-ordination of their efforts and his own just as effectively as this is done by the producer who is making his advertising apply directly to the business of 10,000.

"It can hardly be said by the national advertiser that 'every day is a new beginning'; nevertheless, a great majority of the advertisers who use the pages of the national magazine want new copy and new illustrations every month. If they do not realize the fact, it is a fact, all the same, that they conduct monthly advertising campaigns, and for this reason it would appear that they ought to provide the facilities for enabling their dealers to 'keep up with the procession.' Is it possible in the absence of such a provision for the advertising to function properly?"

From the point of view of both the manufacturer of gas appliances who desires the gas company to use his advertising material and the gas company that desires the citizen to buy its product, the value of a co-ordination of all forms of publicity deserves consideration.

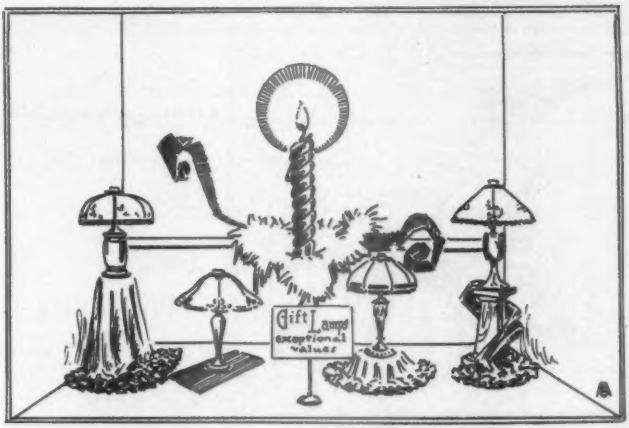
Under the plan submitted by the Sales Development Committee on Special Campaigns it will be possible for manufacturers and companies to effect a tie-up of monthly advertising material that may become so widespread that it will convince those who hesitate to participate, by the sheer force of its accomplishments.

Meanwhile, the Monthly Window Display Service of the Association has made every effort to supply designs that will fit into the seasonable advertising and selling efforts of its member companies.

New System for Distributing A. G. A. Sketches

In order to spread more widely the special sketches which the Window Display Service provides each month, the Association has decided to send out this material as a regular section of the MONTHLY. No separate sheets will henceforth be sent out.

On the two following pages will be found displays appropriate for use during December and the first week in January. If your company receives but one copy of the MONTHLY, see that these sketches reach the man who trims your windows.

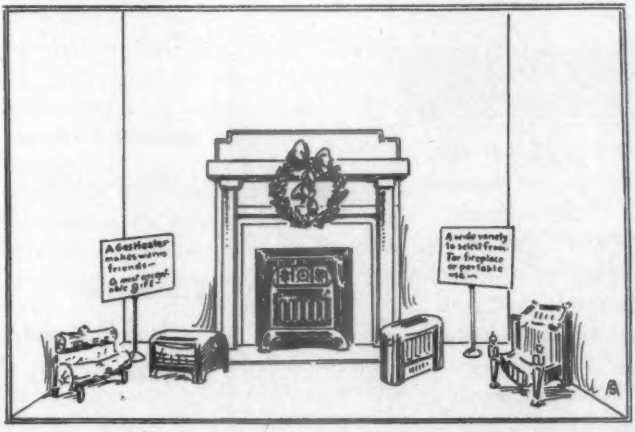


Gas Lighting No. 9a

Nov.-Dec., 1919

Pleasing Lamp and Pleasant Light

A cut-out that suggests both light and the Christmas spirit forms the center of the display. Use a standard background or one decorated with holly and bells. The candle may be an imitation one piped for gas, and kept burning, or the bright red candle, the yellow flame, the circle of orange rays and the bank of evergreen can be painted on wall board. The pedestals are to be covered with bright red velour, or mats of the same material will serve. Several carefully selected and attractive lamps must be arranged in good order. If the illumination of the display comes from the lamps only, the soft mellow light will be very effective.



Heaters No. 9b

Nov.-Dec., 1919

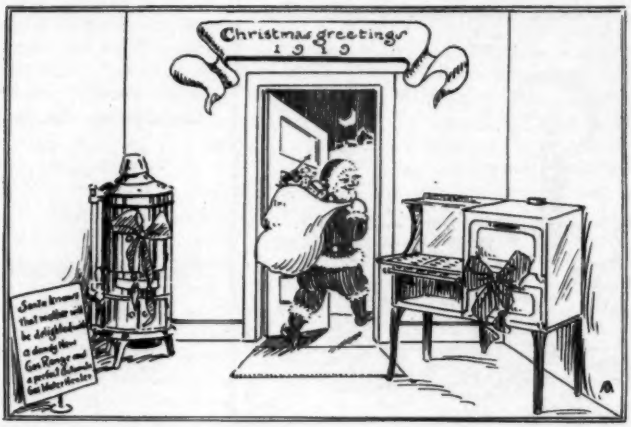
Warmth of Friendship Here

The fireplace heater deserves to come into its own during the Christmas season. An attractive model should be placed in a real or imitation fireplace, the mantle of which is decorated in holiday style. The heater should be alive, or the effect of fire produced with red glass and electric bulbs. If the work is very well done, a cut-out of both heater and fireplace can be effectively used.

Place a variety of other types of heaters about the window and add small price cards. The two large signs read:

"A Gas Heater Makes Warm Friends. A Most Acceptable Gift."

"A Wide Variety to Select From—For Fireplaces or Portable Use."



Kitchen Equipment No. 9c

Nov.-Dec., 1919

A Hint for Useful Giving

"Santa knows that mother will be delighted with a dandy new gas range and perfect gas water heater."

Large and expensive gifts, such as pieces of furniture, and phonographs, to members of the family, are quite the accepted custom. Why not suggest such useful gifts as a gas range or an automatic water heater? It requires only a persistent and forceful suggestion to make Christmas shoppers feel the appropriateness and wisdom of such gifts.

The background here is a painted drop set into a door frame made of wood or wall board. If desired, the Santa Claus may be a cut-out or a wax figure placed against the scene.

Special No. 9d

Nov.-Dec., 1919

Express Your Good Will and Cheer

There is much to be said for the suggestion that during the period that includes Christmas and New Year's days the gas company's window eliminate all merchandise and arrange a display to extend the season's greetings to the public.

The display features a large panel of light blue cardboard with green lettering and embellished capitals in red. The frame is gilded and the heavy red curtains, which are hung well to the front, are draped up with gold rope. The entire window should be lined with black and an intense light concentrated on the panel itself.

TECHNICAL SECTION

L. R. DUTTON, Chairman — W. S. BLAUVELT, Vice-Chairman

H. W. HARTMAN, Secretary

MANAGING COMMITTEE — 1920

At Large

BLAUVELT, W. S., Detroit, Mich.
CASTOR, W. A., Philadelphia, Pa.
COLLINS, D. J., (Mfr.) Philadelphia, Pa.
CONGDON, R. C., Atlanta, Ga.
DUTTON, L. R., Jenkintown, Pa.
EARNSHAW, E. H., Newark, N. J.
FIELDNER, A. C., Pittsburgh, Pa.
FORSTALL, WALTON, Philadelphia, Pa.
HARPER, R. B., Chicago, Ill.
MACARTHUR, DONALD, Jersey City, N. J.
MACBETH, A. B., Los Angeles, Cal.
NORTON, H. A., (Mfr.) Boston, Mass.
UHLIG, E. C., Brooklyn, N. Y.
WILLIEN, L. J., Boston, Mass.

Representing Affiliated Societies

BROWN, J. A., Jackson, Mich. (Michigan)
CHUBB, C. N., Davenport, Ia. (Iowa)
CORNISH, R. C., Philadelphia, Pa. (Pennsylvania)
DEXTER, MACD., Columbus, Ga. (Southern)
GREY, J. C., Fort Wayne, Ind. (Indiana)
HART, J. G., Waukegan, Ill. (Illinois)
HUMPHRIES, J. J., Montreal, Canada. (Canada)
JONES, JACOB B., Bridgeton, N. J. (New Jersey)
LYONS, B. F., Beloit, Wisc. (Wisconsin)
PAIGE, C. E., Malden, Mass. (N. E. Gas. Eng.)
SEDBERRY, W. H., Marshall, Tex. (South Central)

CHAIRMEN OF SECTION COMMITTEES ORGANIZED TO DATE

By-Products—
Carbonization—
Cast Iron Pipe Standards—WALTON FORSTALL, Philadelphia, Pa.
Chemical—E. C. UHLIG, Brooklyn, N. Y.
Purification—
Consumers Meters—W. A. CASTOR, Philadelphia, Pa.
Depreciation Value on Plant and Distribution Equipment—
Design of Distribution Systems—
Disposal of Waste from Gas Plants—L. J. WILLIEN Boston, Mass.
Electrolysis—
Gas Works Auxiliaries—
Refractory Materials—

THE general policy of the Technical Section in completing its organization for 1919-1920 has been to carry over all committees whose work was unfinished last year, retaining a nucleus of the former personnel and appointing new members whose viewpoints will undoubtedly be of assistance. Certain additional committees are also being appointed, the need for which was suggested by the recent Convention.

A good geographic distribution of committee membership is being obtained through suggestions secured from the representatives of affiliated societies on the Managing Committee. Committee chairmen have been requested to include one or more representatives of smaller companies on each committee so that recommendations may be adjusted to the needs and limitations of the smaller company.

Co-Chairmen of all committees are being appointed and where the chairman represents the eastern territory, the co-chairman will be selected from the West, or vice versa. This is with a view to holding concurrent meetings of western members where attendance at eastern meetings is found impracticable.

ANNOUNCEMENT

At the recent Convention a lively discussion ensued on the method of carrying out the Kunberger test for oxide. The Chairman of the Chemical Committee requested at the meeting that suggestions be sent to him along these lines. To date only one has been received, and the Chairman wishes again to request that if any member has comments or criticisms on this method or any methods to be incorporated in the Gas Chemists' Handbook, that he kindly send them to

(Continued on page 647)

Standardization

OF the various activities undertaken in Association work there can be little question that among the most important are those directed toward standardization of materials and the adoption of uniform practice. A brief review of association proceedings of the past would indicate not only that most of the effort of the association was directed toward standardization but also that the most lasting benefits to this industry have resulted from work which has secured the adoption of standards in some form or another.

The objects sought by all standardization show how important it is from the standpoint of their own work that our members co-operate to the fullest extent in this branch of the American Gas Association's service. These objects may be briefly summarized as follows: To arrive at the best practice for accomplishing a given end; to crystallize the best thought of the industry on problems common to all; and most important, to secure the greatest possible economy in operation, installations and repairs.

The Association's part in attaining these desirable results consists of initiating work on matters requiring standardization; acting as a medium for bringing together men qualified to study the problem; affording an opportunity at the Convention for the discussion and adoption of suggestions, and finally, giving to the standards so adopted full publicity and distribution among our members.

The rest is up to you. Before the results sought can be finally accomplished the members must study the reports of the standardization committees and apply the recommendations to their own work. If there are vital objections these should be communicated to the chairman and the particular committee given an opportunity for reply or any necessary further consideration.

Cast Iron Pipe Joints Standards

At the recent Convention two committee reports embodying important standardizations were adopted. The first of these, by the Cast Iron Pipe Joints Committee, is the result of four years' work. The lack of uniform practice in joint making was forcefully brought to the attention of the American Gas Institute in 1915 and a committee was immediately appointed to standardize practice.

The Committee presented progress reports in 1915, 1916 and 1917 and worked very hard to develop from the various ideas and practices of distribution engineers a type of joint that would remain tight at various pressures and call for the least possible expenditure of money. This work has involved many laboratory experiments and the collection of data on the existing practices of gas companies. As the Committee report will be published in pamphlet form, it suffices to say here that the final report involves the adoption of a *tentative alternate standard bell* and recommendations for its use with combination or cement joints.

The Committee has exhausted every theoretical means for determining the tightness of the joint and feels that the adoption of the suggested standard bell in practice will result in the following economies:

Reduction of the expense to gas companies and pipe manufacturers resulting from varying specifications for special joints designed by individual engineers on high pressure work.

Saving due to economy of the joint recommended as compared to other joints now in use.

Saving in leakage if the recommended joint proves tight in practice.

Reduction of electrolytic damage due to the lower conductivity of cement joints.

To bring this report properly before our members the Association plans to issue it in pamphlet form with a cut and the dimensions of the tentative standard bell printed on a special sheet. This sheet can be torn out and pasted in the "Standard Specifications for Cast Iron Pipe and Special Castings" as a companion sheet to the present standard bell shown on page 9. The pamphlets will be distributed to our company members with a note requesting that they be given to the proper men in each organization, for consideration. A letter will also be written by the Committee on Cast Iron Pipe Standards to all pipe manufacturers calling their attention to the tentative standard bell and requesting their co-operation.

This will practically complete the present story of standardization of pipe joints so far as the Association and its Committee are concerned. The Committee has not had an easy task in co-ordinating the views of its members and other distribution engineers. Its membership has included men of wide experience in the making of joints and the recommendations represent their combined judgment after four years of study.

But as stated before, the rest is up to you. Before the economies sought by the adoption of the tentative standard can be secured, the new bell must be given a thorough and general trial in actual practice.

The Association is distributing the report separate from the PROCEEDINGS so that it may be brought forcefully to your attention. We ask that, with an open mind, you read it as soon as you receive it, and decide to what extent you can co-operate by giving the new bell a trial. If you entertain objections to any recommendations write Mr. Walton Forstall, % The United Gas Improvement Company, 1401 Arch Street, Philadelphia, Pa., who will welcome such communications.

Standard Meter Testing

The second report involving the adoption of standards is that of the Consumers Meters Committee. The recommendations of this Committee covering the proof testing of meters will also be printed and distributed in pamphlet form. The importance in this work of uniform practice by all companies is obvious and we ask that the recommendations of the Committee also receive your careful consideration. Communications relative to the Committee's recommendations should be addressed to Association headquarters or to the chairman, whose appointment will be announced in the next issue of the Monthly.

(Continued from page 645)

E. C. Uhlig, Chairman Chemical Committee, 191 St. James Place, Brooklyn, N. Y.

These should be received as soon as possible as the Committee wishes to finish its work on the Handbook. Members who took part in the discussion at the Convention are requested to send copies of their remarks to the Chairman as the minutes of the meeting will not be available for some time.

Standpipe Stoppages

IN view of the fact that stoppages in standpipes have long been counted among the most annoying and persistent troubles encountered in the operation of a gas works, gas manufacturers are always in a mood to listen to the description of any method or system that has been credited with minimizing or eliminating the difficulty. Mr. Leigh Wickham of The Parker-Russell Mining and Manufacturing Company has submitted the following explanation and recommendations of the Congdon Scrubber Standpipe System which was patented and first put in use in 1913. The two major claims made for the system are the ease and small first cost with which existing benches can be equipped with it, and the simplicity and effectiveness of its operation. Where stoppages in standpipes are prevented, it becomes unnecessary to employ labor to "bull" the pipes and where each standpipe becomes an intensive scrubber in itself, the burden on the usual scrubbing and condensing apparatus can be greatly relieved.

The Congdon System was first installed in 1913, at the Atlantic Gas Light Company's works after a series of experiments that covered nearly a year. The accompanying cut shows its application to a set of through benches of 8's.

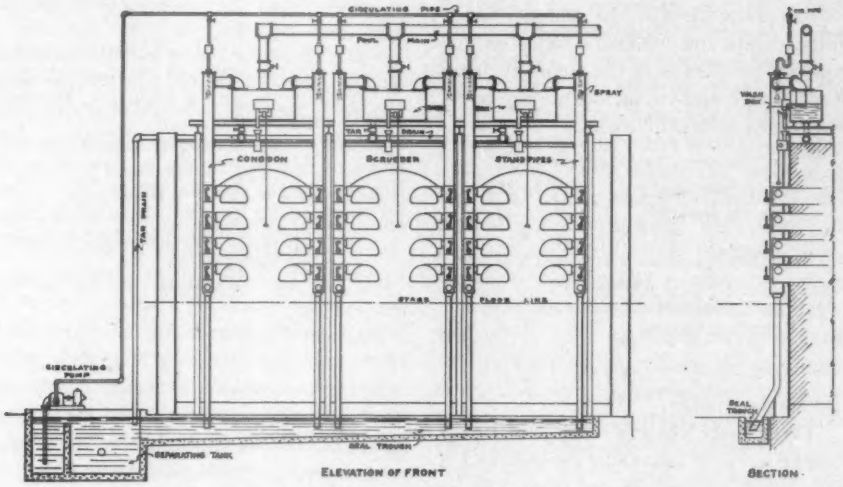
The system consists of the patented pipes with their valves and connections to the hydraulic mains, the sprays at the tops and the seals at the bottoms of the pipes, together with a trough to convey tar and liquor to a separating tank. A pump is provided to pump the liquor to the sprays which are located inside the bridge pipes. Where the hot liquor thus comes in contact with the much hotter gas, the heavy tar condenses and coats the sides of the standpipes with a film which is constantly moving. There is, then, little possibility that the tar will stick to the pipes and bake into pitch and lamp black that will cause a stoppage.

The retort house liquor is used over and over again and there is practically no loss of free ammonia because the liquor is too hot to absorb it. It must be remembered, however, that only hot liquor should be used and to make up any shortage, a new supply should be drawn from the pipes before it reaches the primary condensers.

Where old installations are to be changed to the Congdon System, practically the entire old bench mountings, such as mouthpieces, hydraulic mains, stand, bridge and dip pipes, can be utilized. Where the space between the mouthpieces and the buckstaves is limited, the system may be installed without using the standpipe valves and satisfactory results are obtained. The use of the valves, however, prevents any loss of gas if running with a seal or any drawing in of air if running without a seal, when the mouthpiece lids are open for charging and drawing.

In equipping old benches, special cast iron fittings are sometimes made to connect the mouthpieces with the Congdon pipes. In some cases the hubs of the mouthpieces must be plugged up and holes cut in their sides for special connections designed to go between the mouthpieces and the Congdon pipes.

The simple operation of the system permits the arrangement for taking care



Congdon Scrubber Standpipe System (Patented 1914)

of the tar and ammonia to be made in many ways. If the entire system can be closed, any possible loss of free ammonia is prevented. This, however, depends upon local conditions and the first cost of installation. Two tests were recently made for the possible loss of free ammonia, under the open system.

Test No. 1 was made in the N. P. Pratt Laboratory of Atlanta, Ga., and reported on June 26 by W. C. Dumas, Chief Chemist, who with the help of Mr. W. P. Heath, also of the laboratory, visited the gas works on June 23rd, and drew three samples of the circulating liquor, as follows:

No. 1—At the entrance to the pumps
No. 2—From the top of the bench
No. 3—From the bottom of the bench.

The analysis of these samples was as follows:

	Entrance to pumps Per cent.	Top of bench Per cent.	Bottom of bench Per cent.
Total ammonia	0.257	0.248	0.239
Free ammonia	0.068	0.068	0.063
Combined ammonia ...	0.189	0.180	0.176

Mr. Dumas comments "From the above results it doesn't seem that there is any appreciable loss of ammonia from the circulating system. In fact the free ammonia at the bottom of the bench is slightly lower than elsewhere—which may be accidental."

Test No. 2 is reported on July 18 by Mr. P. T. Dashiell, Assistant Engineer of Works at the Atlanta Gas Light Company.

Sample of Liquor Taken Entering Standpipe.

Fixed ammonia	.93
Volatile ammonia	.38
Total	1.31

Exit of Standpipe (i. e. the trough)

Fixed ammonia	1.00
Free ammonia	.42
Total	1.42

SECOND TEST.

Entrance to Standpipe.

Fixed ammonia	.93
Free ammonia	.37
Total	1.30

Exit of Standpipe.

Fixed ammonia	.92
Free ammonia	.39
Total	1.31

Compare with this the test of liquor which enters the hydraulic main on the stop-end benches with the ordinary form of standpipe and comes out of the overflow of the hydraulic main.

Entrance to Standpipe.	
Fixed ammonia	.88
Volatile ammonia	.24
Total	1.12
Exit of Standpipe.	
Fixed ammonia	.95
Volatile ammonia	.26
Total	1.21

Mr. Dashiell adds:

"These tests show a very small percentage of free ammonia present and a very small percentage of loss. It is rather remarkable, though, that the total strength of the liquor should be as much as 1.4 per cent., as shown in the first test. This seems to be regularly the case in this installation, due to the fact that the same liquor is recirculated so often."

After the Atlanta Gas Light Company, in 1913, had equipped its entire plant with the system here described, a new installation of five through benches of 8's, 20 feet long, was put in for the Taunton Gas Light Company. Other situations which use the system are:

The Utah Coke and Gas Co., Salt Lake City, Utah.
The Lansing Gas & Fuel Co., Lansing, Mich.
The United Gas Improvement Co., Philadelphia, Pa.
The Southern Public Utilities Company of Greenville and Charlotte, N. C.
Decatur Railway & Light Co., Decatur, Ill.
The Benton Harbor St. Joseph Gas and Fuel Co., Benton Harbor, Mich.
The Mobile Gas Co., Mobile, Ala.
Jacksonville Gas Co., Jacksonville, Fla.
The Rome Gas, Electric Light & Power Co., Rome, N. Y.

The last five installations are for incline benches.

In a recent installation of particular interest the gas company is applying the Congdon system on old benches. There are twenty through benches of 8's in one stack and sixteen through benches of 9's in another, all of which have been in operation for a number of years. One bench at a time is being equipped and the old mouthpieces, stand, bridge and dip pipes are retained. On one stack connections to the Congdon pipes have been made by special cast iron fittings attached to the mouthpieces with iron straps. The pipes are sealed at the bottom and the overflow from each individual seal flows into an open wooden trough which runs the entire length of the house and empties into an open separating tank. In this particular installation no valves are used in the pipes.

A visit to one or more of the above mentioned plants should prove interesting to anyone who has not solved his standpipe troubles.

An Unusual Condition of Vibration in Blast Pipes and Blowers

JAMES N. DOWNEY—Public Service Gas Company, Camden, N. J.

THE following description of blower and blast main trouble and the problem it presents may prove of interest to members of the A. G. A.

The blower in question was located in Camden, N. J. and the installation consisted of two units, alike in design, installed in 1911 and 1916, for use on a water gas plant consisting of 10′ 6″ and 7′ 6″ U. G. I. machines previously operated by Sturtevant fans. The blowers were of 112 cu. ft. displacement de-

signed to operate at 150 revolutions, at 2 lbs. difference in pressure, and were direct connected to 12" x 30" Corliss engines with a mercury float pressure control and a blast relief system on water gas machines. The piping from these blowers was 30" riveted partly steel and partly tin and never gave any trouble other than a small amount of vibration.

In the spring of this year, a new generator house was erected and connected with the present blowing plant by 400 feet of 30" welded steel main, 3/16" thick, laid overhead. In this line were four 90° long radius bends, four 45° bends and one "Y" inside the generator house. The operating requirement for the 11' machine in the new house, was 20,000 cu. ft. of air per minute, at 45" pressure. While we did not expect to obtain this amount of air from either one of our blower units, we counted on 16,000 cu. ft. of air per minute at a blower speed of 175 r. p. m. at the given pressure. This was about the limit of the horse power development on the 12 x 30 engine and the blower builder felt that the blower could be operated at this new speed.

The blast main to the new generator house, while rather long, conforms to usual practice for gas works and at the time of its layout and erection nothing was thought of its being the source of any annoyance. The joints were made up with red lead and the pipes were supported where necessary, by curved cast iron rollers resting in cradles. Where the pipe passed through a wall, a clearance was allowed, to avoid every possibility of the shattering of the plaster by even the very slight amount of pipe vibration that was expected. The clearance space was to be closed with hair felt.

At the moment when air was put into the main for the purpose of a test at 50" of water pressure, a violent vibration started, accompanied by a noise resembling cobble stones rolling inside the pipe or a riveting hammer operated outside.

Although this strange noise and the violent vibration (more like surging of pipe than anything else) were considered peculiar and pronounced troublesome, it was felt that no difficulty would be experienced in removing the condition, which was attributed to errors in construction work.

As the main was overhead at an elevation of 20', the sound could be plainly heard a half mile away and the neighborhood rose up in arms against this particular new noise, intermittent as it was, occurring while the blast was on, with a few frills at the start and finish. The noise made by the tin explosion heads on the ends of the blast main, sounded like the operation of a gattling gun. From the vibration of the generator house operating floor, it could be easily seen that joints in the water, steam and oil pipes would soon commence to leak.

Seeking the Remedy

As a first step in stopping the trouble, the blower was examined by an expert from the factory to make sure that it was in proper adjustment. However, as neither the operating blower nor the reserve unit made a noise when operated in connection with the other 30" blast line leading to the old generator house (a distance of 60'), the question of blower adjustment was eliminated.

Both blowers were then tried on the new pipe and the noise occurred with each. This seemed to indicate that the noise was in the pipe and we tried the experiment of inserting in the pipe between flanges, gaskets made of battleship linoleum and of substituting wooden heads of wainscoting for the tin heads on the ends of the main. The gaskets did no good at all and the change of heads changed the tone of the noise in

the generator house from a tenor to a bass while the vibration or surging continued as before.

It was then thought that the pipe itself caused the sound waves, and that by breaking the wave lengths, the noise would be eliminated. Two sections of the steel main, two feet long, were removed, and a rubber dredging sleeve clamped to the ends of the pipe to close the gaps. One of these was placed near the blower where the noise seemed to start and the other, near the generator house where the noise and vibration appeared most violent, but the sleeves did no good at all. The columns of steel frames supporting the main, vibrated like fiddle strings and the vibration could be felt under foot.

The claim was then made that the main was insufficiently anchored but as it was an overhead line, a continuous anchorage, such as is feasible for underground or surface pipe, could not be obtained. The pipe was accordingly wedged tight, wherever possible, with wood, and spanish windlasses of rope and cable were placed on it to hold it down. It still continued to vibrate and set up a similar vibration in all the attached braces, guys and walls.

Sound Expert Investigates

A sound expert was now sent for to study the noise and vibration as they were related in frequency of rattle or sound to the speed of the engine, in multiples of four or two, or in a single beat per revolution. His diagnosis was that the impellers were striking on the blower case, although the blower manufacturer maintained that the adjustment was O. K.

The noise would occur at 100 to 175 revolutions of the engine and again it would not occur. The attempt to duplicate it by striking the impeller case with a rotating cast iron weight showed that such waves were not audible at any point in the main except in the vicinity of the blower, although they could be detected with a stethoscope. As the pipe appeared to be haunted, it became a curiosity and numerous inspections and suggestions were made.

Variety of Causes Suggested

The rubber heads on the ends of the blast main practically eliminated the noise at this point.

When it was suggested that the gates were rattling in open or partly open valves, the valves were either entirely opened or tightly closed. Those open were then held rigid by jack screws through the bonnet of the valve, but no change resulted.

It was thought that the length of the pipe line had some bearing on the question. When the line was parted in the middle and an orifice valve had been attached, the only pipe that did not make a noise was the detached section. When the entire pipe was detached and the orifice valve attached to the pipe plate of the blower, the thrashing of the impellers inside the case made it impossible to determine whether the noise in question was still there, but opinion was in the affirmative.

The rollers supporting the main were next suspected and wherever the pipe came in contact with iron or brick, a pad of heavy rubber belting was inserted. Thus the main touched nothing but wood or rubber, but no change in effect was produced.

The "egg crate" device as sometimes used for straightening out the flow of air through a pipe was now tried. It consisted of 3" stove pipes of lengths varying from 2' 6" to 3' 6", in a nest inserted in the main near the blower. It may have straightened out the sound waves but it did not remove the noise.

Perforated plates were then inserted between the flanges to act on the sound waves, with no results.

A rubber tube converging from 30" to 20", about 3' long, with a flanged end, was inserted near the outlet of the blower and considerably reduced the surging effect since it had a steadying influence on the flow of air but it did not reduce the noise.

Preparations were also made to place an enlarged section of main in the form of a tank 5' in diameter by 22", in conjunction with the other main to form two paths for the air to travel, the idea being that the sound waves would have different lengths in the two paths. In addition, prices were obtained for muffling the outside of the pipe with two plys of hair felt held in place by wooden staves.

The Critical Point in Speed X Pressure

All these suggestions did not change the noise in the main but from continuous observations and tests varying the speed of the blower with a constant pressure or varying the pressure of the blower with a constant speed, it was seen that when the product of speed (in r. p. m.) and pressure (in inches of water) reached 5,000, the noise would start and become more violent as this product increased. Without going near the blower, it was possible to calculate within a half inch the water column pressure by figuring the speed of the blower as indicated by the frequency of the sound and dividing this number into 5,000.

It did not seem possible that such a relation existed but to prove it, other positive blowers and gas pushers were tried. It was found that a medium pressure blower used for distribution work at Jersey City had the same noise on the overhead steel piping at the evening pull, when it was operating at its highest speed and pressure. The engineer put a second pusher to work and the noise stopped. Apparently what he did was to reduce the product of speed and pressure per unit below the critical point.

A blower at Newark of 175 cu. ft. capacity, at 3 lbs. pressure and 135 r. p. m. was subjected to two distinct tests—one with varying speed and the other with varying pressure. It showed a constant (pressure times speed) of between 6,900 and 7,000. The main was about 500 ft. long, the first 100 ft. being underground and of cast iron while the remainder was overhead and of steel 3/16" thick and 30" in diameter. The noise appeared in the overhead steel piping. The question of cast iron or steel as the conducting medium had been investigated and tests with a stethoscope showed that the cast iron did not have the sounding board effect of the steel main. While no underground steel mains could be found to test and also no overhead cast iron mains, it is assumed that both would have a deadening influence on the sound produced.

In the Newark blower the constant represented so critical a point in the blower that the fluttering of the ball governor of the engine which drove it, would cause the noise to start, provided the pressure was at the proper point, and a short count of the engine speed showed only a variation of 2 or 3 revolutions. For instance, the blower at Camden operating at 100 r. p. m. and 50", starts to make a noise in the pipe. At 98 revolutions, the noise is not apparent. The appearance and disappearance of the noise was very puzzling in the beginning of the investigation but with the discovery of the relation of speed and pressure to it, experiments tending to steady the engine speed governor at the moment when the noise began or ceased, soon showed the cause. It would appear from the Newark blower that its constant should be 10935—the product of 81"

of water column (3 lbs.) and 135 r. p. m.—but actually the critical point was 7,000 or only about two thirds; in the Camden machine, the product as rated would be 8,100, while actually it was only 5,000.

The cure in the case of the Camden blower was to operate the regular and reserve blowers together at 100 r. p. m. each at a pressure of 45", instead one unit as intended at 175 r. p. m. and 45". One unit can be operated at 175 r. p. m. and 28" without making a noise.

Theory Accounting for Blower Constant vs. Noise

The question is, having found this condition to exist, what are the reasons for it and the theory that accounts for it? Apparently the blower operated satisfactorily mechanically, for the Camden blower ran for almost a month with this noise before it was stopped. Both speed and pressure enter into calculations of brake H. P. required at the blower shaft, according to Root's formula, which is based on the hydraulic formula; but only pressure would produce a deflection in the impeller shaft and cause it to strike, (if striking were the source of the noise).

For a given diameter of shaft the maximum strength is developed when the case length is about equal to impeller diameter. That is to say, under such conditions the strength of the shaft to resist bending strains is equal to its strength to resist torsional strains. The shaft in a blower is subjected to both bending and torsion and its moment of resistance to bending is one half that to twisting strains. The torsional stress on the shaft is inversely proportional to the velocity of rotation, under a constant transmission of power. The bending stress may stay constant or be reduced or increased, depending on whether the pressure is reduced or increased, with a change in velocity of rotation. From this it will be seen that where the increased power requirements of the blower are produced by pressure, bending and torsion are directly affected.

It is impossible to see how speed enters into the effect other than by centrifugal force and where the impeller and shaft are balanced, this does not exist. The shaft is used severely because of its sudden subjection to and release from pressure, and it is stiffened to a noticeable degree by the cast iron impellor. Its total length from coupling to rear bearing must be considered for torsional strain, while only the inside of the case need be considered for bending strain. This would seem to indicate that the noise was produced by torsion rather than by bending, and it fits in with the statement made above; namely, that the blower can be run indefinitely in spite of the noise. If the trouble were caused by linear deflection of the impeller and shaft, operation would be impossible.

Again, if the trouble were due to bending it would be rather a steady strain varying from 50% to its full value. In the case of torsion , there is a time in the revolution of the impeller when a strain balances itself, and another time when, at its maximum, it shifts suddenly to the opposite side of the impeller as it passes the discharge cut-off. To do this, it must necessarily pass through zero. The sudden change of pressure on the impeller undoubtedly releases any torsional strain that may be produced in the shaft by the load carried and in its sudden application again, the element of time appears, in that at slower speeds the transformation is more gradual and it attended by less shock. If on a line devoid of pressure, a steam valve is thrown open quickly, a hammering effect is produced.

Calculations made on the Camden blower relative to the size of shaft re-

quired showed that it was ample for normal conditions, not taking into consideration sudden shocks and, if anything, even slightly larger than is allowed on some other blowers of the same size.

It might be that the waists of the impellers are not proportioned correctly, but, as there is practically no spring on cast iron, this would show up as a defect.

Why is it that this sound appears in steel rather than in cast iron as evidenced both in the piping at Newark and in the fact that the noise does not occur in the blower itself?

Does the pressure and speed product find its relation to the noise from the fact that air pocketed between the impeller and case, is suddenly changed from zero pressure to outlet pressure at the discharge cut-off, the effect of the change varying directly with either the pressure or speed?

Is it that the torsional strain which produces on the shaft of the Camden blower a deflection of about 0° 3′ (which is within the limits) is so magnified when it is carried to the tip of the impeller that with the sudden shift of the pressure as it passes the discharge cut-off, it produces a whipping motion of the shaft which, communicated in turn to the impeller, produces the sound in the outlet piping?

The problem was considered solved by the discovery of the critical operating point on the blowers tested but the theory as to the reason for the noise has not yet been satisfactorily stated.

Water Gas Oil Efficiency on a B. T. U. Basis

R. C. DOWNING—By-Product Coke Corporation, Indiana Harbor, Ind.

[NOTE.—This is the third article on the above subject, which has appeared in the Association MONTHLY (see July and August). It presents a curve designed to determine the B. t. u. of gases for oils varying 20 per cent. or more in quality. The author does not claim that the curve will check absolutely with operating data, but the method has checked experimental data within 2 per cent.—*Editor.*]

IT is often desirable to know what may be expected of a gas oil before it is given a trial in the water gas machine. In other words, when a certain grade of gas oil is purchased the buyer is interested to know how many gallons he will be required to use to produce a thousand feet of gas of a specified heating value. The larger gas companies have given much time and study to this question and their laboratories are prepared to give an answer as to the quality of oils purchased. Usually a rather complicated method of testing is required. As a result of research on this subject, the writer has correlated data which enable one to calculate with reasonable accuracy the B. t. u. per gallon which any grade of oil will produce. The only testing required is a simple oil distillation.

This test is made as follows:—

About 250 cc. of the oil are weighed into a 500 cc. Engler distilling flask. The flask is protected from drafts and distillation is conducted at a rate of about 3 drops per second until the dry point is reached. Fractions are removed as the mercury thread of the thermometer passes the 400, 500, 600 and 700° F. marks, each fraction being collected in a separate tared flask. The distillation is stopped when an increase in height of the burner flame results in a drop of temperature amounting to at least 10° F. The percentage by weight and specific gravity at 60° F. of each fraction is obtained. Sufficient data are now available to calculate the B. t. u.

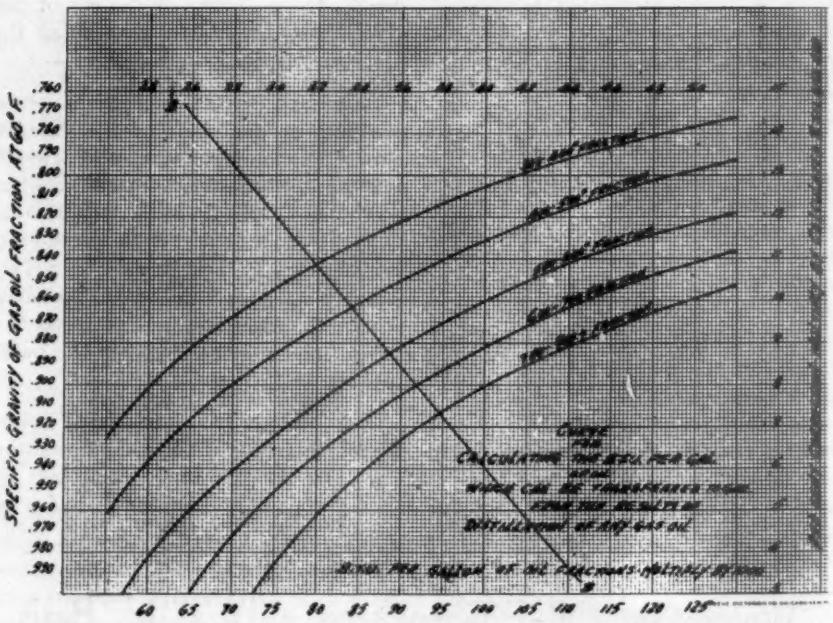


Fig. 1.

which will be transferred to the gas when carbureting a gallon of oil. Further calculations can then be made of the probable B. t. u. per cubic foot of the carbureted gas, at any given rate of oil consumption.

To calculate the B. t. u. transferred to the gas per gallon of oil used, proceed as follows:

Run a line from the scale which denotes the specific gravity of the 400 to 500 fraction, to the point of intersection with the curve designated the same way. Run vertically downward to the scale, which indicates the B. t. u. per gallon contributed by that fraction. Multiply this reading by the proportion by weight of this fraction.

Proceed in the same way for the remaining fractions. Then add the results obtained for each fraction. The sum will be the calculated B. t. u. per gallon of the oil.

Since the curves used were derived from experiments made by cracking or carbureting oils and oil fractions at the high oil rate of 5 gallons per M., a correction is necessary to obtain the B. t. u. per gallon at the intended oil rate. The per cent. correction to be added is found by using the curve marked B.

Knowing the B. t. u. per gallon of the oil at any given rate of consumption, the B. t. u. per cubic foot may be easily calculated by the following formula. (2). The derivation of this formula is given to illustrate the reason for its use.

Let X = B. t. u. per cu. ft. of carb. water gas.
A = gal. of oil per M.
B = B. t. u. per gal. of oil.
300 = B. t. u. per cu. ft. of blue gas.
C = cu. ft. of oil gas per gal. of oil.

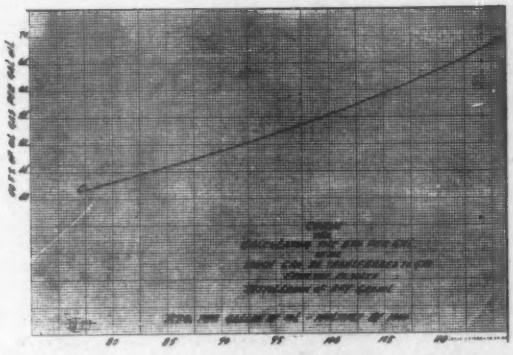


Fig. 2.

Then AC = cu. ft. of oil gas per M cu. ft. of carb. water gas.

1000—AC = cu. ft. of blue gas per M cu. ft. of carb. water gas.

$\frac{1000-AC}{1000}$ = parts of blue gas in 1 cu. ft. of gas.

$300\,\frac{(1000-AC)}{1000}$ = B. t. u. of blue gas in 1 cu. ft. of gas.

Simplifying

300—.3 AC = B. t. u. of blue gas in 1 cu. ft. of gas.

X — (300—.3 AC) = B. t. u. of oil gas in 1 cu. ft. gas.

(1) $\frac{(X - 300 + .3\,AC) \times 1000}{A} =$ B (B. t. u. per gal. of oil.)

(2) $X = \frac{AB}{1000} + 300 - .3\,AC.$

To use this formula it is necessary to know the value of C, or the cubic feet of oil gas produced per gallon of oil. Different grades of oil show a wide variation in the amount of oil gas they can produce. However, there is a definite relation which exists between the B. t. u. per gallon of oil transferred to the gas, and the cubic feet of oil gas produced. This relation is shown by the curve C. Furthermore, this curve serves as a means of supplying the value of C when B is known. This value represents the cubic feet of oil gas made when the temperature is about 1,350° C.

The following examples illustrate the use of the curves. Two oils are purchased, which on distillation, yield the following results:—

Oil No. 1

I. Boiling point of fraction	II. Sp. gr. of fraction	III. Per cent. by wt. of fraction	IV. B. t. u. per gal. of fraction	V. Product of III × IV.
0—400 °F.	...	Trace	....	....
400—500	.824	38.76	105000	40700
500—600	.861	34.72	100000	34720
600—700	.899	19.70	92500	18200
700—	.925	6.16	90500	5580
Residue	...	0.66	....	....
Total		100.00		99200
Specific gravity of oil				.871
Calculated B. t. u. per gallon				99,200
Correction to B. t. u. per gallon				8,340
Calculated at 3.6 gal/M				107,540

OIL NO. 2

I. Boiling point of fraction of	II. Sp. gr. of fraction at 60 °F.	III. Per cent. by wt. of fraction	IV. B. t. u. per gal. of fraction	V. Product of III × IV.
0—400 °F.	...	....	....	....
400—500	.855	30.58	87500	26750
500—600	.901	34.05	82500	28100
600—700	.950	25.58	75500	19300
700—	.986	7.86	75000	5890
Residue	...	1.93	....	....
Total		100.00		80040

Specific gravity of oil	.908
Calculated B. t. u. per gallon	80,040
Correction to B. t. u. per gallon	6,750
Calculated B. t. u. at 3.6 gallon	86,790

At 3.6 gallons per M, the B. t. u. correction would be 8.4 per cent., and this correction is to be added to the B. t. u. calculated from analysis.

At this oil rate, the oil gas which can be made by a gallon of oil No. 1 will be approximately 61 cu. ft. and by oil No. 2 about 46.5 cu. ft. By substituting these values for (C) in equation (2) we find that 3.6 gallons per M of oil No. 1 will give a gas of 622 B. t. u. per cu. ft., while oil No. 2 will produce only 562 B. t. u. per cu. ft. of gas.

These values are somewhat higher than what will actually be obtained in practice, as they are based upon laboratory results, where much better control can be had of the temperatures, and the carbureting surface can be kept free from carbon. They are useful, however, in ascertaining what may be expected when a change in the grade of gas oil used in operation is made.

Furthermore the data gathered by an engineer of one company on a certain type of oil may not be at all suitable to another who operates under different conditions, and with oils varying widely in quality. The curves given have been found suitable for all types of oil and will check laboratory cracking tests within 2 per cent.

RECENT ARTICLES IN CHEMICAL PRESS OF INTEREST TO GAS MEN

Contributed by Sub-Committee on Abstracts* of the Chemical Committee

GOVERNMENT HELIUM PLANTS. Anonymous, *Chemical and Met. Eng.*, Vol. 21, No. 6, 276 (Sept. 15, 1919). A general description of the Government plants for making helium from natural gas. (F. W. Sperr, Jr.)

REFRACTORY PROBLEMS IN THE GAS INDUSTRY (Paper at Philadelphia meeting, American Chemical Society). By W. H. Fulweiler and J. H. Taussig, *Chemical and Met. Eng.*, Vol. 21, No. 6, p. 290-293 (Sept. 15, 1919). An outline of the paper read at the meeting is given. Refractory bricks for coal gas retorts and water gas retorts and the cements used are considered. (F. W. Sperr, Jr.)

* Abstractors' names appear in brackets following each item.

CARBON BLACK. (Paper at Philadelphia meeting, American Chemical Society.) By G. St. J. Perrott, *Chemical and Met. Eng.*, Vol. 21, No. 6, p. 290-293 (Sept. 15, 1919). An outline of this paper was read at the meeting. Carbon black is made by burning natural gas with an insufficient supply of air for combustion. The various processes for its manufacture have been investigated. (F. W. Sperr, Jr.)

INDUSTRIAL ANALYSIS OF GAS MIXTURES BY THE REFRACTOMETRIC METHOD. (From June, 1919 issue of *Chimie et Industrie*, pp. 647-655), by Prof. Marcel Pouchon, *Chemical and Met. Eng.*, Vol. 21, No. 6, pp. 392-395 (Sept. 15, 1919). A portable type of Lord Rayleigh's Interferometer will give rapid analyses of mixtures of two gases. By adjusting a micrometer screw, comparison is made between the gas mixture to be analyzed and a standard gas. For mixtures composed of more than two gases, the interferometric method does not present any advantage over the standard volumetric or gravimetric methods. The method is based on the difference between the indices of refraction of the two gases. The apparatus is used industrially. (F. W. Sperr, Jr.)

STEAMING HORIZONTALS AT FRANKFORT. Anonymous, *Chemical Abstracts*, Vol. 13, 2433 (Oct. 10, 1919). Comparison of tests with and without steaming. (E. J. Murphy.)

AUTOMATIC GAS ANALYSIS APPARATUS. (U. S. Patent 1,309,681), by J. A. Fries, *Chemical Abstracts*, Vol. 13, 2304, (Oct. 10, 1919). (E. J. Murphy.)

NEW FORMS OF INSTRUMENTS FOR SHOWING THE PRESSURE AND AMOUNT OF COMBUSTIBLE GAS IN THE AIR. By E. R. Weaver and E. E. Weibel, *Chemical Abstracts*, Vol. 13, 2301, (Oct. 10, 1919). It deals for the most part in principles already established, but the authors have developed new and practical forms of instruments. Specifications for construction of these instruments and directions for their use are given in full. (E. J. Murphy.)

DIFFERENTIAL PRESSURE METERS FOR MEASURING AIR, GAS AND STEAM FLOWS. By J. L. Hodgson, *Chemical Abstracts*, Vol. 13, 2302, (Oct. 10, 1919). Gives a description of the apparatus on which accurate readings may be obtained down to 1/9 or 1/10 of maximum flow. (E. J. Murphy.)

REFRACTORY MATERIALS AND HIGH TEMPERATURE MEASUREMENTS. By C. W. Kanolt, (Bureau of Standards, Washington, D. C.) *Journal of the Franklin Institute*, 188, 489-505 (Oct., 1919). The author discusses the theory of temperature and gives its thermodynamic definition. The constant volume hydrogen thermometer has been adopted for defining the standard thermometer scale. The theory and operation of thermocouples, resistance thermometers, optical and radiation pyrometers, and pyrometric cones are presented. The following table of temperatures is of interest, the first two being estimates based upon phenomena of radiation and spectra:

	Centigrade Degrees
Stars (at surface) ...up to about	20,000
Sun (at surface)	6,000
Highest temperature yet produced artificially	6,000
Carbon arc	3,800
Tungsten melts	3,400
Magnesia melts	2,800
Lime melts	2,570
Iron boils	2,450
Copper boils	2,300
Alumina melts	2,050
Platinum melts	1,755
Fireclay melts .....1,560 to	1,725
Palladium melts	1,550
Pure iron melts	1,530
Nickel melts	1,452
Cast iron melts .....1,100 to	1,250
Copper melts	1,083
Gold melts	1,063
Silver melts	961
Antimony melts	630
Sulphur boils	444.6
Zinc melts	419
Tin melts	232

The melting point is capable of precise definition for a pure substance but not for such a material as fire brick which contains several anisotropic phases. The point of transition to a fluid state although not definite is capable of approximate determination practically valuable. Fire clay brick are made chiefly of kaolin, Al_2O_3. 2 $Si O_2$. 2 H_2O, which when heated forms Al_2O_3. $Si O_2$ and $Si O_2$, the mixture softening at about 1,740° C. Commercial clay brick have softening temperatures lower than this but in some cases approaching it closely. Softening points of other refractories are: silica brick, approaching 1,710° C., magnesia brick (containing iron) 2,000°-2,200° C., chromite brick (valuable in resisting fluxing action of any fused materials), about 2,050° C.

War problems in refractories are outlined. (H. C. Porter.)

MAMMOTH COKE BLAST FURNACE AND STEEL PLANT. By Frank F. Marquad, *Chemical Abstracts*, Vol. 13, 2589 (Oct. 20, 1919). A description of The Clairton By-Product Coke Plant of the Carnegie Steel Company. (E. J. Murphy.)

COAL TAR AND COAL TAR PRODUCTS. By A. B. Stevens, (*Journal of the Society of Dyers and Colorists*, Vol. 34, 56 (1919)) *Chemical Abstracts*, Vol. 13, 2589 (Oct. 20, 1919). The main methods of tar distillation and the purification of the various products are touched on and the uses in dye, explosives, drug and photographic industries are discussed. (E. J. Murphy.)

PULVERIZED COAL FOR STATIONARY BOILERS. By F. A. Scheffler and H. G. Barnhurst, (*Mech. Eng.*, Vol. 41, 650-652 (1919)) *Chemical Abstracts*, Vol. 13, 2587 (Oct. 20, 1919). The authors discuss the use of pulverized coal as fuel for stationary boilers as compared with stoker firing. A table, showing preliminary tests made on pulverized fuel plants, is given. Costs are also discussed in detail. (E. J. Murphy.)

THE SULFUR OF COAL. By J. P. Wibant and A. Stoffel, (*Review Trav. Chim.*, Vol. 38, 132-58 (1919)) *Chemical Abstracts*, Vol. 13, 2586 (Oct. 20, 1919). The inorganic and organic sulfur of coal and its transformation during the manufacture of coke. Experiences in the quantitative determination of the pyrite of the coal. (E. J. Murphy.)

A MACHINE FOR THE TESTING OF THE HOT-CRUSHING STRENGTH OF FIRE BRICKS. By H. G. Schmecht (*Journal of Amer. Ceramic Society*, Vol. 2, 602-7 (1919)), *Chemical Abstracts*, Vol. 13, 2583 (Oct. 20, 1919). A detailed description with drawings of a machine in which two bricks may be tested at the same time. (E. J. Murphy.)

THE CARBONIZATION OF MISSOURI CANNEL COALS. By Howard Leroy Dunlap, Karl K. Kershner and Vivian X. Smiley (*School Mines and Met.*, Univ. Mo., *Bul.* 5, 52 (1919)), *Chemical Abstracts*, Vol. 13, 2588 (Oct. 20, 1919). A detailed study of four different cannel coals from Missouri and one Wyoming coal. Tables, curves and illustrations are given. (E. J. Murphy.)

PULVERIZED COAL AS A FUEL. By N. C. Harrison (*Mech. Eng.*, Vol. 41, 645-649 and 652-662 (1919)), *Chemical Abstracts*, Vol. 13, 2587 (Oct. 20, 1919). The author reviews the use of pulverized coal in the industries. A description of a plant for pulverizing and the costs of installing and of pulverizing are given for plants of from 10 to 250 times a day. Specifications for the pulverized coal are given. (E. J. Murphy.)

The Percentage of Etheylene in Carbureted Water Gas

[EDITOR'S NOTE.—As a result of the offer of the Chemical Committee to co-operate with Association members on chemical problems, a number of inquiries have been received and answered during the past year. It has been decided that where these inquiries involve questions of general interest, an abstract of the replies made shall be published in the MONTHLY. The Chemical Committee again wishes to place its services at the disposal of our members for such assistance as it may render in their chemical problems and it requests that correspondents observe, so far as possible, the following points in submitting inquiries:

1. Make your inquiry specific.
2. Give full operating details connected with your problem so that the Committee may know how the problem arose and can limit its investigation to the exact information required.
3. Be assured that all such details will be treated confidentially, as the identity of the correspondent is not disclosed in the Committee's investigations.]

The question given below was one of a number referred to the Chemical Committee last year and there follows an abstract of the answers contributed.

Question:—Is it possible to increase the percentage of ethylene, or unsaturated gases, in the manufacture of carbureted water gas; what is necessary to effect such increase; what can be expected in the net result and what would be the effect on the B. t. u. if such gases were entirely extracted before delivery to the consumers' appliances?

Abstract of Answers:—From the nature of the question it is assumed that by "ethylene" is meant the unsaturated hydrocarbons commonly designated as "illuminants" in the analysis of water gas. In accordance with this assumption it may be stated that where gas oil is being used so as to secure the maximum possible "candles per gallon" or "B. t. u. per gallon" the resultant water gas will contain the maximum percentage of "illuminants."

The conditions for obtaining the maximum percentage of "illuminants" are dependent on the gas machine, the gas oil used, the operating conditions, the temperature of cracking, the volume of gas being made and many other factors. The temperature is especially important and has been stated as falling between the limits of 1,300° F. and, possibly, 1,400° F. Temperature above the upper limit will decompose the unsaturated gases and form methane and carbon.

To effect an increase in the percentage of "illuminants," some starting point must be defined. If the average temperature in the carbureter and superheater were below 1,300° F. (say 1,200° F.), the logical method would be gradually to bring it up by steps of 50° F., observing the change in the percentage of "illuminants" at each step as shown by an analysis of the gas. Conversely, if the temperatures were, say 1,450° F., they would be brought lower in steps of 50° F. It must be borne in mind, however, that the percentage of "illuminants" cannot be increased without, at the same time, increasing the content of aromatic vapors (benzol series).

In answer to the last question—"What can be expected in the net result and what would be the effect on the B. t. u. if such gases were entirely extracted before delivery to the consumers appliances?" the committee submitted the following:

It is highly problematical whether all the so-called "illuminants" could be extracted without effect on the other constituents of the gas, but assuming that they could be, it may be calculated that for every cubic foot of "illuminants" so extracted per M cubic feet, there would be a reduction in the total heating value available per M cubic feet of about 2,500 B. t. u. For example, assume that we have a carbureted water gas with a total heating value of 575 B. t. u. per cubic foot, containing 10 per cent. of "illuminants" having a total heating value of 2,500 B. t. u. per cubic foot; then we should have:,

1,000 cubic feet of gas containing 575,000 B. t. u.
Remove 100 cubic feet of "illuminants" containing 250,000 B. t. u.
There would remain
900 cubic feet of gas containing 325,000 B. t. u. or

$\frac{325,000}{900}$, or about 361 B. t. u. per cubic foot as a total heating value of the remaining gas. This means a total reduction of 214 B. t. u. per cubic foot.

Attention is called to the following research work on this subject:

Journal of Industrial & Engineering Chemistry, May 1914.

Bureau of Standards, Technologic Paper No. 117.

Some Fundamentals Affecting the Utilization of Gas Oil in Carbureted Water Gas Manufacture, by R. C. Downing, Illinois Gas Ass'n. *Proceedings* 1916.

Bureau of Mines Publications.

E. C. UHLIG,
Chairman, Chemical Committee.

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REES, RICHARD, Kalamazoo, Mich.
ROBERTS, EARL W., Detroit, Mich.
ROPER, GEO. D., Rockford, Ill.
SCHAEFFER, W. L., Pittsburgh, Pa.
SCHALL, H. D., Detroit, Mich.
WICKHAM, LEIGH, St. Louis, Mo.

Representing Affiliated Societies

BARTLETT, C. E., Philadelphia, Pa. (Pennsylvania)
GIBSON, W. R., Toronto, Can. (Canadian)
LONG, H. J., New Brunswick, N. J. (New Jersey)
MCCULLOUGH, CHAS., Milwaukee, Wis. (Wisconsin)
MILLER, THOS. D., Detroit, Mich. (Illinois)
WARREN, W. M., St. Louis, Mo. (Iowa Dist.)
WESTON, J. A., Lansing, Mich. (Indiana)
YOUNG, L. B., Detroit, Mich. (Michigan)

CHAIRMEN OF SECTION COMMITTEES ORGANIZED TO DATE

Membership—WM. M. CRANE, New York, N. Y.
Apparatus Makers—D. J. COLLINS, Philadelphia, Pa.
Nomination—WM. M. CRANE, New York, N. Y.
Exhibition—W. GRIFFIN GRIBBEL, Philadelphia, Pa.
Trade Acceptances—GEO. H. WARNER, New York, N. Y.

"Success waits upon ability and loyalty. Let's Go!" — *Geo. B. Cortelyou*

An Echo from the Exhibition

Pittsburgh, Pa.
Frick Building.
October 20, 1919.

MR. W. W. BARNES
Secretary, Manufacturers Section
AMERICAN GAS ASSOCIATION
130 East 15th Street
New York City, New York.

DEAR SIR:

In Re: American Gas Association Convention.

The writer was in attendance at the above Convention two days of last week, and our other representatives who were in attendance throughout the week, have confirmed the writer's observation that this was a thoroughly successful affair, and one of the outstanding features about the whole convention was the manner in which the personnel of your office handled the affairs about the Exhibit Hall.

One of our men went out of his way to explain to me the courteous treatment received at all times in connection with the handling of the material from the time it landed in New York until it was shipped, and as we have occasion to make a considerable number of exhibits in the course of a year, good or indifferent service is apparent to us, and we should like for you to know that we appreciated greatly the spirit of cooperation in connection with this exhibit.

Very truly yours,
NATIONAL TUBE COMPANY.
(Signed) W. L. SCHAEFFER.
(Advertising Department)

ALL Manufacturer company members who are interested in the export market are earnestly requested to get in touch with the Secretary of the Manufacturers Section as frequent inquiries are received at headquarters for connections with manufacturers of gas appliances, apparatus, etc. for export.

(Continued on page 672)

Classified Directory--Manufacturers of Gas Equipment

Company Members Only, American Gas Association, Inc.

ARC LAMPS (Gas)

General Gas Light Co., New York, N. Y., and Kalamazoo, Mich.
Johnson Gas Appliance Co., Cedar Rapids, Iowa
Welsbach Co., Gloucester, N. J.

BENCHES

J. H. Gautier & Co., Jersey City, N. J.
Russell Engineering Co., St. Louis, Mo.
The Gas Machinery Co., Inc., Cleveland, Ohio
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.

BENCH IRON WORK

Davis & Farnum Mfg. Co., Waltham, Mass.
Isbell-Porter Co., Newark, N. J.
Russell Engineering Co., St. Louis, Mo.
The Bartlett Hayward Co., Baltimore, Md.
The Gas Machinery Co., Cleveland, Ohio
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.
The Stacey Mfg. Co., Cincinnati, Ohio
The Western Gas Construction Co., Fort Wayne, Ind.

BOILERS (Gas)

Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
Wm. Kane Mfg. Co., Inc., 1915 Adams St., Philadelphia, Pa.
Kidde & Co., 169 Chambers St., New York, N. Y.
F. W. Ofeldt & Sons, Nyack, N. Y.
The Bryant Heater & Mfg. Co., Cleveland, Ohio
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

BOILERS (Gas for House Heating)

Dodd Heating Systems Limited, Toronto, Ont.
Kidde & Co., 169 Chambers St., New York, N. Y.
The Bryant Heater & Mfg. Co., Cleveland, Ohio

BOILERS (Waste Heat)

The Bartlett Hayward Co., Baltimore, Md.
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.

BLOWERS, BOOSTERS, EXHAUSTERS

Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.
Isbell-Porter Co., Newark, N. J.
Maxon-Premix Burner Co., Muncie, Ind.
The Gas Machinery Co., Cleveland, Ohio
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The C. M. Kemp Mfg. Co., Baltimore, Md.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.
The Western Gas Construction Co., Fort Wayne, Ind.
Wilbraham-Green Blower Co., Pottstown, Pa.
L. J. Wing Mfg. Co., 362 West 13th St., New York, N. Y.

BRAZING TABLES

Rathbone, Sard & Co., Albany, N. Y.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

BROILERS (Hotel)

Geo. M. Clark & Co., Div., Chicago, Ill.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Rathbone, Sard & Co., Albany, N. Y.
The Michigan Stove Co., Detroit, Mich.

BURNERS (Industrial)

Century Stove & Mfg. Co., Johnstown, Pa.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Equitable Meter Co., Pittsburgh, Pa.
General Fire Extinguisher Co., Providence, R. I.
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
International Hale Gas Mixer Co., Providence, R. I.
Johnson Gas Appliance Co., Cedar Rapids, Iowa
Maxon-Premix Burner Co., Muncie, Ind.
Tate-Jones & Co., Inc., 50 Church St., New York, N. Y.
The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.
The Eclipse Stove Co., Mansfield, Ohio
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The C. M. Kemp Mfg. Co., Baltimore, Md.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.
The A. H. Wolff Gas Radiator Co., 4 Great Jones St., New York, N. Y.

BURNERS (Lighting)

American Meter Co., Inc., 105 W. 40th St., New York, N. Y.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
General Gas Light Co., New York, N. Y., and Kalamazoo, Mich.
Johnson Gas Appliance Co., Cedar Rapids, Iowa

Lindsay Light Co., New York, N. Y., and Chicago, Ill.
Welsbach Co., Gloucester, N. J.

BY-PRODUCT OVENS

By-Product Coke Corp., Chicago, Ill.
Foundation Oven Corporation, Woolworth Building, New York, N. Y.
Semet-Solvay Co., Syracuse, N. Y.
The Gas Machinery Co., Cleveland, Ohio
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Koppers Co., Pittsburgh, Pa.
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.

BY-PRODUCT RECOVERY APPARATUS

Foundation Oven Corporation, Woolworth Building, New York, N. Y.
Isbell-Porter Co., Newark, N. J.
The Bartlett Hayward Co., Baltimore, Md.
The Gas Machinery Co., Cleveland, Ohio
The Koppers Co., Pittsburgh, Pa.
The U. G. I Contracting Co., Broad & Arch Sts., Philadelphia, Pa.
The Western Gas Construction Co., Fort Wayne, Ind.

CALORIMETERS

American Meter Co., Inc., 105 W. 40th St., New York, N. Y.
D. McDonald & Co., Albany, N. Y.
Maryland Meter Works, Baltimore, Md.
Nathaniel Tufts Meter Works, 455 Commercial St., Boston, Mass.
Superior Meter Co., Brooklyn, N. Y.

CASING, TUBING (Steel)

National Tube Co., Frick Bldg., Pittsburgh, Pa.

CHARGING COAL

Isbell-Porter Co., Newark, N. J.
The Bartlett Hayward Co., Baltimore, Md.
The Gas Machinery Co., Cleveland, Ohio
The Western Gas Construction Co., Fort Wayne, Ind.

COAL AND COKE (Conveyors, Crushers, Screeners)

R. H. Beaumont Co., 315 Arch St., Philadelphia, Pa.
Isbell-Porter Co., Newark, N. J.
The Bartlett Hayward Co., Baltimore, Md.
The Gas Machinery Co., Cleveland, Ohio
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.

COAL TAR PRODUCTS & CHEMICALS

The Barrett Company, 17 Battery Place, New York, N. Y.

COCKS (Ranges, Water Heaters, Service and Meter)

A-B Stove Co., Battle Creek, Mich.
Claus Automatic Gas Cock Co., Milwaukee, Wis.
Hays Mfg. Co., Inc., Erie, Pa.
Johnson Gas Appliance Co., Cedar Rapids, Iowa
Kitson Co., 2837 Oakford St., Philadelphia, Pa.
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.
Standard Brass Works, Detroit, Mich.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Roberts Brass Mfg. Co., Detroit, Mich.

COMPRESSORS

Plant Engineering & Equipment Co., 192 Broadway, New York, N. Y.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The C. M. Kemp Mfg. Co., Baltimore, Md.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

CONDENSERS

Camden Iron Works, Camden, N. J.
Cruse-Kemper Co., Ambler, Pa.
Davis & Farnum Mfg. Co., Waltham, Mass.
Isbell-Porter Co., Newark, N. J.
Steere Engineering Co., Detroit, Mich.
The Bartlett Hayward Co., Baltimore, Md.
The Gas Machinery Co., Cleveland, Ohio
The Stacey Mfg. Co., Cincinnati, Ohio
The Stacey Bros. Gas Construction Co., Cincinnati, Ohio
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.
The Western Gas Construction Co., Fort Wayne, Ind.

COOKING AUXILIARIES

Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Duparquet, Huot & Moneuse Co., 108 W. 22nd St., New York, N. Y.
Johnson Gas Appliance Co., Cedar Rapids, Iowa
The G. S. Blodgett Co., Burlington, Vt.
The General Gas Appliance Co., 103 Park Ave., New York, N. Y.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Scott Gas Appliance Co., 1311 E. St., N. W., Washington, D. C.

COUPLINGS

S. R. Dresser Mfg. Co., Bradford, Pa.

CYLINDERS (Pressure)

National Tube Co., Frick Bldg., Pittsburgh, Pa.

DECALCOMANIA PRODUCTS

The Meyercord Co., Inc., Chamber of Commerce Bldg., Chicago, Ill.

DYES, DISINFECTANTS, DRY COLORS

The Sherwin-Williams Co., Cleveland, Ohio, New York, N. Y.

ELECTRIC CONTROLLING DEVICES

The Cutler-Hammer Mfg. Co., Milwaukee, Wis.

EXCHANGERS (Heat)
The Bartlett Hayward Co., Baltimore, Md.
The Western Gas Construction Co., Fort Wayne, Ind.

EXPERT APPRAISAL
Steere Engineering Co., Detroit, Mich.
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.

EXTRACTORS (Tar, Dust, Fumes)
Isbell-Porter Co., Newark, N. J.
The Bartlett Hayward Co., Baltimore, Md.
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.
The Western Gas Construction Co., Fort Wayne, Ind.

FITTINGS
A-B Stove Co., Battle Creek, Mich.
Will W. Barnes, 31 Chelsea Place, East Orange, N. J.
Claus Automatic Gas Cock Co., Milwaukee, Wis.
Davis & Farnum Mfg. Co., Waltham, Mass.
S. R. Dresser Mfg. Co., Bradford, Pa.
Eriez Stove & Mfg. Co., Erie, Pa.
General Fire Extinguisher Co., Providence, R. I.
Kitson Co., 2827 Oakford St., Philadelphia, Pa.
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.
Shapiro & Aronson, Inc., 20 Warren St., New York, N. Y.
Standard Brass Works, Detroit, Mich.
The Gas Machinery Co., Cleveland, Ohio
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Roberts Brass Mfg. Co., Detroit, Mich.
The Western Gas Construction Co., Fort Wayne, Ind.
Welsbach Co., Gloucester, N. J.

FITTINGS (Malleable Iron)
Stanley G. Flagg & Co., 1421 Chestnut St., Philadelphia, Pa.

FLEXIBLE TUBING
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Titeflex Metal Hose Corp., Badger Ave., Newark, N. J.

FLASHLIGHTS AND BATTERIES
Will W. Barnes, 31 Chelsea Place, East Orange, N. J.

FUEL BRIQUETTING
Foundation Oven Corporation, Woolworth Building, New York, N. Y.
General Briquetting Co., 25 Broad St., New York, N. Y.

FURNACES
Century Stove & Mfg. Co., Johnstown, Pa.
Eriez Stove & Mfg. Co., Erie, Pa.
Geist Mfg. Co., Atlantic City, N. J.
Johnson Gas Appliance Co., Cedar Rapids, Iowa
Maxon-Premix Burner Co., Muncie, Ind.
Russell Engineering Co., St. Louis, Mo.
Tate-Jones & Co., Inc., 50 Church St., New York, N. Y.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

GAS ENGINES
The Bartlett Hayward Co., Baltimore, Md.
United Lead Co., 111 Broadway, New York, N. Y.

GAS ENGINE COCKS AND VALVES
Standard Brass Works, Detroit, Mich.

GAS IRONS
A-B Stove Co., Battle Creek, Mich.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Johnson Gas Appliance Co., Cedar Rapids, Iowa
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Perfect Combustion Co., Chicago, Ill.
Strause Gas Iron Co., Philadelphia, Pa.

GAS LOGS
Backus Heater & Foundry Co., Inc., Boston, Mass.
The Mead Gas Heater Co., Delawanna, N. J.
Strait & Richards, Inc., Newark, N. J.

GAS MIXERS
Century Stove & Mfg. Co., Johnstown, Pa.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Eriez Stove & Mfg. Co., Erie, Pa.
Geist Mfg. Co., Atlantic City, N. J.
General Fire Extinguisher Co., Providence, R. I.
Hays Mfg. Co., Inc., Erie, Pa.
Improved Appliance Co., Inc., 419 Kent Ave., Brooklyn, N. Y.
International Hale Gas Mixer Co., Providence, R. I.
Johnson Gas Appliance Co., Cedar Rapids, Iowa
Maxon-Premix Burner Co., Muncie, Ind.
Strait & Richards, Inc., Newark, N. J.
Tate-Jones & Co., Inc., 50 Church St., New York, N. Y.
The C. M. Kemp Mfg. Co., Baltimore, Md.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

GAS PLANTS (Blue)
The Bartlett Hayward Co., Baltimore, Md.
The Gas Machinery Co., Cleveland, Ohio
The Improved Equipment Co., 60 Wall St., New York, N. Y.

The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.
The Western Gas Construction Co., Fort Wayne, Ind.

GAS PLANTS (Carbureted Water)

Gas Machinery Co., Cleveland, Ohio
The Bartlett Hayward Co., Baltimore, Md.
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Stacey Mfg. Co., Cincinnati, Ohio
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.
The Western Gas Construction Co., Fort Wayne, Ind.

GAS PLANTS (Coal) (Engineers)

Camden Iron Works, Camden, N. J.
Davis & Farnum Mfg. Co., Waltham, Mass.
Isbell-Porter Co., Newark, N. J.
Russell Engineering Co., St. Louis, Mo.
Semet-Solvay Co., Syracuse, N. Y.
Steere Engineering Co., Detroit, Mich.
The Bartlett Hayward Co., Baltimore, Md.
The Gas Machinery Co., Cleveland, Ohio
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.
The Stacey Mfg. Co., Cincinnati, Ohio
The Stacey Bros. Gas Construction Co., Cincinnati, Ohio
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.
The Western Gas Construction Co., Fort Wayne, Ind.

GAS RANGE WATER HEATERS

Elliott Water Heater Co., Inc., 1246 Myrtle Ave., Brooklyn, N. Y.

HEATERS (Room)

Backus Heater & Foundry Co., Inc., Boston, Mass.
Century Stove & Mfg. Co., Johnstown, Pa.
Geo. M. Clark & Co. Div., Chicago, Ill.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Detroit Stove Works, Detroit, Mich.
Eclipse Gas Stove Co., Rockford, Ill.
Eriez Stove & Mfg. Co., Erie, Pa.
Estate Stove Co., Hamilton, Ohio
Geist Mfg. Co., Atlantic City, N. J.
General Fire Extinguisher Co., Providence, R. I.
General Gas Light Co., New York, N. Y., and Kalamazoo, Mich.
Illinois Specialty Mfg. Co., Bloomington, Ill.
Kidde & Co., 169 Chambers St., New York, N. Y.
Lawson Mfg. Co., Pittsburgh, Pa.
New Process Stove Co. Div., Cleveland, Ohio.
Reliable Stove Co. Div., Cleveland, Ohio.
Reznor Mfg. Co., Mercer, Pa.
Roberts & Mander Stove Co., Philadelphia, Pa.
J. B. Slattery & Bro. Inc., 108-110 Lawrence St., Brooklyn, N. Y.
Strait & Richards, Inc., Newark, N. J.
The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.
The Champion Stove Co., Cleveland, Ohio
The Mead Gas Heater Co., Delawanna, N. J.
The Ohio State Stove & Mfg. Co., Columbus, Ohio.
The Sanitary Heating Co., 233 37th St., Brooklyn, N. Y.
The Western Gas Construction Co., Fort Wayne, Ind.
The A. H. Wolff Gas Radiator Co., 4 Great Jones St., New York, N. Y.

HEATERS (Garage)

Kidde & Co., 169 Chambers St., New York, N. Y.

HEATERS (Pressing and Soldering Irons)

Geo. M. Clark & Co. Div., Chicago, Ill.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Eclipse Gas Stove Co., Rockford, Ill.
Estate Stove Co., Hamilton, Ohio
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
Johnson Gas Appliance Co., Cedar Rapids, Iowa
Strait & Richards, Inc., Newark, N. J.
The Bryant Heater & Mfg. Co., Cleveland, Ohio
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

HIGH PRESSURE SYSTEMS

Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.
General Fire Extinguisher Co., Providence, R. I.
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.
Selas Co., 521 W. 23d St., New York, N. Y.
The Gas Machinery Co., Cleveland, Ohio
The C. M. Kemp Mfg. Co., Baltimore, Md.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

HOLDERS (Structural Steel Works)

Camden Iron Works, Camden, N. J.
Cruse-Kemper Co., Ambler, Pa.
Davis & Farnum Mfg. Co., Waltham, Mass.
The Bartlett Hayward Co., Baltimore, Md.
The Stacey Bros. Gas Construction Co., Cincinnati, Ohio
The Stacey Mfg. Co., Cincinnati, Ohio
The Western Gas Construction Co., Fort Wayne, Ind.

HOT PLATES

A-B Stove Co., Battle Creek, Mich.
Century Stove & Mfg. Co., Johnstown, Pa.
Geo. M. Clark & Co. Div., Chicago, Ill.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Detroit Stove Works, Detroit, Mich.
Eclipse Gas Stove Co., Rockford, Ill.
Eriez Stove & Mfg. Co., Erie, Pa.

General Gas Appliance Co., 103 Park Ave., New York, N. Y.
Rathbone, Sard & Co., Albany, N. Y.
J. B. Slattery & Bro., Inc., 108-110 Lawrence St., Brooklyn, N. Y.
The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.
The Champion Stove Co., Cleveland, Ohio
The Eclipse Stove Co., Mansfield, Ohio
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Michigan Stove Co., Detroit, Mich.
The A. H. Wolff Gas Radiator Co., 4 Great Jones St., New York, N. Y.
The Ohio State Stove & Mfg. Co., Columbus, Ohio.
Union Stove Works, 20 Beekman St., New York, N. Y.
Weir Stove Co., Taunton, Mass.

INCINERATORS
Estate Stove Co., Hamilton, Ohio
Ruud Mfg. Co., Pittsburgh, Pa.

INSTRUMENTS (Measuring, Testing and Recording)
American Meter Co., 105 W. 40th St., New York, N. Y.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, Ohio.
Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.
Equitable Meter Co., Pittsburgh, Pa.
D. McDonald & Co., Albany, N. Y.
Maryland Meter Works, Baltimore, Md.
Precision Instrument Co., 63 Fort St. W., Detroit, Mich.
Republic Flow Meters Co., 565 Washington Blvd., Chicago, Ill.
Steere Engineering Co., Detroit, Mich.
The Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.
The Western Gas Construction Co., Fort Wayne, Ind.

INSULATING MATERIALS
Celite Products Co., 11 Broadway, New York, N. Y.
Davis & Farnum Mfg. Co., Waltham, Mass.

KILNS (For Firing Glass, China and Pottery)
B. F. Drakenfeld & Co., Inc., 50 Murray St., New York, N. Y.
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
Russell Engineering Co., St. Louis, Mo.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

LIGHTERS (Ranges)
Claus Automatic Gas Cock Co., Milwaukee, Wis.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Safety Gas Lighter Co., Haverhill, Mass.
Strause Gas Iron Co., Philadelphia, Pa.
The Michigan Stove Co., Detroit, Mich.
Welsbach Co., Gloucester, N. J.

LIGHTING (Fixtures)
Will W. Barnes, 31 Chelsea Place, East Orange, N. J.
Shapiro & Aronson, Inc., 20 Warren St., New York, N. Y.
Welsbach Co., Gloucester, N. J.

LIGHTING (Gas Domes, Portables, etc.)
Will W. Barnes, 31 Chelsea Place, East Orange, N. J.
Kramer Bros. Lamp Co., 585 Broadway, New York, N. Y.
Shapiro & Aronson, Inc., 20 Warren St., New York, N. Y.
Welsbach Co., Gloucester, N. J.

LIGHTING (Glassware)
Shapiro & Aronson, Inc., 20 Warren St., New York, N. Y.
Welsbach Co., Gloucester, N. J.

LIGHTING (Incidentals)
Storrs Mica Co., Owego, N. Y.

LIGHTING (Mantles)
General Gas Light Co., New York, N. Y., and Kalamazoo, Mich.
Lindsay Light Co., New York, N. Y., and Chicago, Ill.
Welsbach Co., Gloucester, N. J.

METAL RECEPTACLES
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.
United Lead Co., 111 Broadway, New York, N. Y.

METERS
American Meter Co., 105 W. 40th St., New York, N. Y.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, Ohio.
Cleveland Gas Meter Co., Cleveland, Ohio
Equitable Meter Co., Pittsburgh, Pa.
John J. Griffin & Co., 1521 Race St., Philadelphia, Pa.
Helme & McIlhenny, 1349 Cherry St., Philadelphia, Pa.
D. McDonald & Co., Albany, N. Y.
Maryland Meter Works, Baltimore, Md.
Metric Metal Works, Erie, Pa.
Precision Instrument Co., 63 Fort St. W., Detroit, Mich.
Rotary Meter Co., 52 Vanderbilt Ave., New York, N. Y.
Superior Meter Co., Bush Terminal, Brooklyn, N. Y.

The Cleveland Rotary Meter Co., Cleveland, Ohio
The Cutler-Hammer Mfg. Co., Milwaukee, Wis.
The Sprague Meter Co., Bridgeport, Conn.
Nathaniel Tufts Meter Works, 455 Commercial St., Boston, Mass.

METERS (Air and Steam)

Republic Flow Meters Co., 565 Washington Blvd., Chicago, Ill.
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.

METER CONNECTIONS, SEALS, Etc.

American Meter Co., 105 W. 40th St., New York, N. Y.
Cleveland Gas Meter Co., Cleveland, Ohio
S. R. Dresser Mfg. Co., Bradford, Pa.
Equitable Meter Co., Pittsburgh, Pa.
Helme & McIlhenny, 1349 Cherry St., Philadelphia, Pa.
D. McDonald & Co., Albany, N. Y.
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.
Superior Meter Co., Bush Terminal, Brooklyn, N. Y.
The Lattimer Stevens Co., Columbus, Ohio
The Sprague Meter Co., Bridgeport, Conn.
Nathaniel Tufts Meter Works, 455 Commercial St., Boston, Mass.

METER PROVERS

American Meter Co., 105 W. 40th St., New York, N. Y.
Equitable Meter Co., Pittsburgh, Pa.
John J. Griffin & Co., Philadelphia, Pa.
Helme & McIlhenny, 1349 Cherry St., Philadelphia, Pa.
D. McDonald & Co. Albany, N. Y.
Maryland Meter Works, Baltimore, Md.
Superior Meter Co., Bush Terminal, Brooklyn, N. Y.
Nathaniel Tufts Meter Works, 455 Commercial St., Boston, Mass.

METER SHELF

Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.

OFFICE LABOR SAVING DEVICES

Addressograph Co., Chicago, Ill.
Burroughs Adding Machine Co., Detroit, Mich.
Elliott-Fisher Co., Harrisburg, Pa.
Kalamazoo Loose-Leaf Binder Co., Kalamazoo, Mich.
Library Bureau, Boston, Mass.
Monroe Calculating Machine Co., Woolworth Bldg., New York, N. Y.
The Rand Co., North Tonawanda, N. Y.
Underwood Typewriter Co., Vesey St., New York, N. Y.

OIL (Diaphragm)

John J. Griffin & Co., 1521 Race St., Philadelphia, Pa.
Superior Meter Co., Brooklyn, N. Y.

OVENS (Baking and Cooking)

Geo. M. Clark & Co. Div., Chicago, Ill.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Eclipse Gas Stove Co., Rockford, Ill.
Famous Oven Manufacturing Co., 110 W. 42nd St., New York, N. Y.
General Fire Extinguisher Co., Providence, R. I.
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
Meek Oven Mfg. Co., 18 W. 34th St., New York, N. Y.
The G. S. Blodgett Co., Burlington, Vt.
The Crandall-Pettee Co., Hudson St., New York, N. Y.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Ohio State Stove & Mfg. Co., Columbus, Ohio
The Union Steel Products Co., Ltd., Albion, Mich.
The Surface Combustion Co., 366 Gerard Ave., Bronx, N. Y.

OVENS (Annealing, Japanning, Drying, Core, etc.)

Famous Oven Manufacturing Co., 110 W. 42nd St., New York, N. Y.
Gehnrich Indirect Heat Oven Co., Inc., 62 Franklin Ave., Brooklyn, N. Y.
General Fire Extinguisher Co., Providence, R. I.
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
Johnson Gas Appliance Co., Cedar Rapids, Iowa
Meek Oven Mfg. Co., 18 W. 34th St., New York, N. Y.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The C. M. Kemp Mfg. Co., Baltimore, Md.
The Surface Combustion Co., 366 Gerard Ave., New York, N. Y.
The Union Steel Products Co., Ltd., Albion, Mich.
Young Bros. Co., Detroit, Mich.

OVENS (Warming)

Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Eclipse Gas Stove Co., Rockford, Ill.
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
Meek Oven Mfg. Co., 18 W. 34th St., New York, N. Y.
The G. S. Blodgett Co., Burlington, Vt.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Union Steel Products Co., Ltd., Albion, Mich.

PAINTS AND VARNISHES

The Sherwin-Williams Co., Cleveland, Ohio, New York, N. Y.

PHOTOMETERS

American Meter Co., 105 W. 40th St., New York, N. Y.

Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.
D. McDonald & Co., Albany, N. Y.
Maryland Meter Works, Baltimore, Md.
Nathaniel Tufts Meter Works, Boston, Mass.

PIPE

Camden Iron Works, Camden, N. J.
Davis & Farnum Mfg. Co., Waltham, Mass.
General Fire Extinguisher Co., Providence, R. I.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Steere Engineering Co., Detroit, Mich.
The Bartlett Hayward Co., Baltimore, Md.
United Lead Co., 111 Broadway, New York, N. Y.

PIPE CASTINGS AND SPECIALS

Davis & Farnum Mfg. Co., Waltham, Mass.
Isbell-Porter Co., Newark, N. J.
The Bartlett Hayward Co., Baltimore, Md.
The Stacey Mfg. Co., Cincinnati, Ohio
The Western Gas Construction Co., Fort Wayne, Ind.

PIPE CLAMPS AND SLEEVES

Davis & Farnum Mfg. Co., Waltham, Mass.
S. R. Dresser Mfg. Co., Bradford, Pa.

PIPE PACKING

Celite Products Co., 11 Broadway, New York, N. Y.
General Fire Extinguisher Co., Providence, R. I.
United Lead Co., 111 Broadway, New York, N. Y.

PIPE TOOLS (Caulking, Cutting, Tapping)

General Fire Extinguisher Co., Providence, R. I.
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.
United Lead Co., 111 Broadway, New York, N. Y.

PLATE WARMERS

Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Duparquet, Huot & Moneuse Co., 108 W. 22nd St., New York, N. Y.
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

PORCELAIN ENAMEL PARTS

(Stoves, Lamps, Linings, Stamping and Spinnings)

Baltimore Enamel & Novelty Co., Baltimore, Md.
Eclipse Gas Stove Co., Rockford, Ill.
The Enamel Products Co., Cleveland, Ohio
The Porcelain Enamel & Mfg. Co., Baltimore, Md.
The Union Steel Products Co., Ltd., Albion, Mich.

PRESSURE GAUGES

American Meter Co., 105 W. 40th St., New York, N. Y.
Bacharach Industrial Instrument Co.s, Pittsburgh, Pa.
Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.
Equitable Meter Co., Pittsburgh, Pa.
General Fire Extinguisher Co., Providence, R. I.
D. McDonald & Co., Albany, N. Y.
Maryland Meter Works, Baltimore, Md.
Superior Meter Co., Bush Terminal, Brooklyn, N. Y.
The Bryant Heater & Mfg. Co., Cleveland, Ohio
The Cleveland Rotary Meter Co., Cleveland, Ohio.
The Gas Machinery Co., Cleveland, Ohio
The Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.
The Western Gas Construction Co., Fort Wayne, Ind.
Nathaniel Tufts Meter Works, Boston, Mass.

PUMPS

American Meter Co., 105 W. 40th St., New York, N. Y.
Gas Machinery Co., Cleveland, Ohio
Nathaniel Tufts Meter Works, Boston, Mass.
Plant Engineering & Equipment Co., Inc., 192 Broadway, New York, N. Y.
Superior Meter Co., Brooklyn, N. Y.
The Western Gas Construction Co., Fort Wayne, Ind.
L. J. Wing Mfg. Co., 362 West 13th St., New York, N. Y.

PURIFIERS

Camden Iron Works, Camden, N. J.
Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.
Cruse-Kemper Co., Ambler, Pa.
Davis & Farnum Mfg. Co., Waltham, Mass.
Gas Machinery Co., Cleveland, Ohio
Isbell-Porter Co., Newark, N. J.
Steere Engineering Co., Detroit, Mich.
The Bartlett Hayward Co., Baltimore, Md.
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Stacey Bros. Gas Construction Co., Cincinnati, Ohio
The Stacey Mfg. Co., Cincinnati, Ohio
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.
The Western Gas Construction Co., Fort Wayne, Ind.

PURIFYING MATERIALS

Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.
Gas Purifying Materials Co., Long Island City, N. Y.
J. F. Henderson Co., 1707 Commonwealth Bldg., Pittsburgh, Pa.

RADIATORS

James B. Clow & Sons, Chicago, Ill.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Eriez Stove & Mfg. Co., Erie, Pa.
General Fire Extinguisher Co., Providence, R. I.
Kidde & Co., 169 Chambers St., New York, N. Y.
J. B. Slattery & Bro. Inc., 108-110 Lawrence St., Brooklyn, N. Y.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Mead Gas Heater Co., Delawanna, N. J.
The A. H. Wolff Gas Radiator Co., 4 Great Jones St., New York, N. Y.

RANGES (Domestic)

A-B Stove Co., Battle Creek, Mich.
Century Stove & Mfg. Co., Johnstown, Pa.
Geo. M. Clark & Co. Div., Chicago, Ill.
Bartlett & Co., Inc., Philadelphia, Pa.
Comstock-Castle Stove Co., Quincy, Ill.
Abram Cox Stove Co., Philadelphia, Pa.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Detroit Stove Works, Detroit, Mich.
Dangler Stove Co. Div., Cleveland, Ohio.
Eclipse Gas Stove Co., Rockford, Ill.
Eriez Stove & Mfg. Co., Erie, Pa.
Estate Stove Co., Hamilton, Ohio
National Stove Co. Div., Lorain, Ohio.
New Process Stove Co. Div., Cleveland, Ohio.
Quick Meal Stove Co. Div., St. Louis, Mo.
Rathbone, Sard & Co., Albany, N. Y.
Reliable Stove Co. Div., Cleveland, O.
Roberts & Mander Stove Co., Philadelphia. Pa.
The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.
The Champion Stove Co., Cleveland, Ohio
The Eclipse Stove Co., Mansfield, Ohio
The General Gas Appliance Co., 103 Park Ave., New York, N. Y.
The Michigan Stove Co., Detroit, Mich.
The Ohio State Stove & Mfg. Co., Columbus, Ohio
The Peninsular Stove Co., Detroit, Mich.
The A. H. Wolff Gas Radiator Co., 4 Great Jones St., New York, N. Y.
Union Stove Works, 70 Beekman St., New York, N. Y.
Vesta Gas Range & Mfg. Co., Chattanooga, Tenn.
Weir Stove Co., Taunton, Mass.

RANGES (Hotel)

Geo. M. Clark & Co. Div., Chicago, Ill.
Comstock-Castle Stove Co., Quincy, Ill.
Abram Cox Stove Co., Philadelphia, Pa.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Detroit Stove Works, Detroit, Mich.
Duparquet, Huot & Moneuse Co., 108 W. 22nd St., New York, N. Y.
Eclipse Gas Stove Co., Rockford, Ill.
Estate Stove Co., Hamilton, Ohio
The General Gas Appliance Co., 103 Park Ave., New York, N. Y.
Roberts & Mander Stove Co., Philadelphia, Pa.
The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.
The Michigan Stove Co., Detroit, Mich.

REFRACTORY MATERIALS

J. H. Gautier & Co., Jersey City, N. J.
Harbison-Walker Refractories Co., Pittsburgh, Pa.
Quigley Furnace Specialties Co., 26 Cortlandt St., New York, N. Y.
Russell Engineering Co., St. Louis, Mo.
Tate-Jones & Co., Inc., 50 Church St., New York, N. Y.
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.

REGULATORS (Governors)

American Meter Co., 105 W. 40th St., New York, N. Y.
Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.
Equitable Meter Co., Pittsburgh, Pa.
Gas Machinery Co., Cleveland, Ohio
Isbell-Porter Co., Newark, N. J.
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.
Reynolds Gas Regulator Co., Anderson, Ind.
Steere Engineering Co., Detroit, Mich.
Superior Meter Co., Brooklyn, N. Y.
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Cleveland Rotary Meter Co., Cleveland, Ohio
The Sprague Meter Co., Bridgeport, Conn.
The Western Gas Construction Co., Fort Wayne, Ind.
L. J. Wing Mfg. Co., 362 West 13th St., New York, N. Y.

REPAIRS (Gas Meters and Appliances)

Helme & McIlhenny, 1349 Cherry St., Philadelphia, Pa.
Maryland Meter Works, Baltimore, Md.
Superior Meter Co., Brooklyn, N. Y.
The Western Gas Construction Co., Fort Wayne, Ind.

RETORTS

Gas Machinery Co., Cleveland, Ohio
J. H. Gautier & Co., Jersey City, N. J.
Harbison-Walker Refractories Co., Pittsburgh, Pa.
Russell Engineering Co., St. Louis, Mo.
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Parker-Russell Mining & Mfg. Co., St. Louis, Mo.

RUST PREVENTATIVE

Superior Laboratories, Grand Rapids, Mich.

SCRUBBERS

Camden Iron Works, Camden, N. J.
Davis & Farnum Mfg. Co., Waltham, Mass.
Foundation Oven Corporation, Woolworth Building, New York, N. Y.
Gas Machinery Co., Cleveland, Ohio
Isbell-Porter Co., Newark, N. J.
Steere Engineering Co., Detroit, Mich.
The Bartlett Hayward Co., Baltimore, Md.
The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Koppers Co., Pittsburgh, Pa.
The Stacey Bros. Gas Construction Co., Cincinnati, Ohio
The Stacey Mfg. Co., Cincinnati, Ohio
The U. G. I. Contracting Co., Broad & Arch Sts., Philadelphia, Pa.
The Western Gas Construction Co., Fort Wayne, Ind.

SERVICE BOXES, CLAMPS, Etc.

Camden Iron Works, Camden, N. J.
Davis & Farnum Mfg. Co., Waltham, Mass.
General Fire Extinguisher Co., Providence, R. I.
Hays Mfg. Co., Inc., Erie, Pa.
H. Mueller Mfg. Co., New York, N. Y., and Decatur, Ill.

STEAM TRAPS

Plant Engineering & Equipment Co., Inc., (Corliss Valve) 192 Broadway, New York, N. Y.

STILLS (Benzol, Toluol)

Foundation Oven Corporation, Woolworth Building, New York, N. Y.
The Bartlett Hayward Co., Baltimore, Md.
The Koppers Co., Pittsburgh, Pa.
The Walter E. Lummus Co., Boston, Mass.
The Western Gas Construction Co., Fort Wayne, Ind.

STOVES (Confectioners, Laundry, Tailor)

A-B Stove Co., Battle Creek, Mich.
Geo. M. Clark & Co. Div., Chicago, Ill.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
The General Gas Appliance Co., 103 Park Ave., Brooklyn, N. Y.
The Improved Appliance Co., 419 Kent Ave., New York, N. Y.

STRAINERS

Plant Engineering & Equipment Co., Inc., 192 Broadway, New York, N. Y.

STRUCTURAL STEEL WORKS
(See Holders)

TANKS (Ammonia, Oil, Water)

Camden Iron Works, Camden, N. J.
Cruse-Kemper Co., Ambler, Pa.
Davis & Farnum Mfg. Co., Waltham, Mass.
Gas Machinery Co., Cleveland, Ohio
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Steere Engineering Co., Detroit, Mich.
The Bartlett Hayward Co., Baltimore, Md.
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Stacey Bros. Gas Construction Co., Cincinnati, Ohio
The Stacey Mfg. Co., Cincinnati, Ohio
The Western Gas Construction Co., Fort Wayne, Ind.

THERMOMETERS

American Meter Co., 105 W. 40th St. New York, N. Y.
Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.
Gas Machinery Co., Cleveland, Ohio
General Fire Extinguisher Co., Providence, R. I.
Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
The Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.
The Western Gas Construction Co., Fort Wayne, Ind.

THERMOSTATS

Gas Machinery Co., Cleveland, Ohio
Kidde & Co., 169 Chambers St., New York, N. Y.
Minneapolis Heat Regulator Co., Minneapolis, Minn.
B. Ryan & Co., 60 E. 10th St., New York, N. Y.
The Bryant Heater & Mfg. Co., Cleveland, Ohio

THERMO VALVES

Pittsburgh Water Heater Co., Pittsburgh, Pa.

THORIUM

Welsbach Co., Gloucester, N. J.

TRENCH WORK

Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.

TURBINE (Steam)

L. J. Wing Mfg. Co., 362 West 13th St., New York, N. Y.

VALVES

Claus Automatic Gas Cock Co., Milwaukee, Wis.
Connelly Iron Sponge & Governor Co., 227 Fulton St., New York, N. Y.
Gas Machinery Co., Cleveland, Ohio
General Fire Extinguisher Co., Providence, R. I.
Isbell-Porter Co., Newark, N. J.
Plant Engineering & Equipment Co., Inc., 192 Broadway, New York, N. Y.
Steere Engineering Co., Detroit, Mich.
The Bartlett Hayward Co., Baltimore, Md.
The Bryant Heater & Mfg. Co., Cleveland, Ohio
The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.

The Improved Equipment Co., 60 Wall St., New York, N. Y.
The Stacey Mfg. Co., Cincinnati, Ohio
The Western Gas Construction Co., Fort Wayne, Ind.

WATER HEATERS

A-B Stove Co., Battle Creek, Mich.
Bartlett & Co., Inc., Philadelphia, Pa.
Geo. M. Clark & Co. Div., Chicago, Ill.
Abram Cox Stove Co., Philadelphia, Pa.
Wm. M. Crane Co., 16 W. 32d St., New York, N. Y.
Detroit Stove Works, Detroit, Mich.
Eclipse Gas Stove Co., Rockford, Ill.
Estate Stove Co., Hamilton, Ohio
General Gas Appliance Co., 103 Park Ave., New York, N. Y.
Humphrey Co., Kalamazoo, Mich.
Kidde & Co., 169 Chambers St., New York, N. Y.
Lawson Mfg. Co., Pittsburgh, Pa.
Long-Landreth-Schneider & Co., New Brunswick, N. J.
New Process Stove Co. Div., Cleveland, Ohio.
Peninsular Stove Co., Detroit, Mich.
Philadelphia Stove Co., Philadelphia, Pa.
Pittsburgh Water Heater Co., Pittsburgh, Pa.
Rathbone, Sard & Co., Albany, N. Y.
Reliable Stove Co. Div., Cleveland, Ohio
Ruud Mfg. Co., Pittsburgh, Pa.
The Baltimore Gas Appliance & Mfg. Co., Baltimore, Md.
The Bryant Heater & Mfg. Co., Cleveland, Ohio
The Cleveland Heater Co., Cleveland, Ohio
The Hoffman Heater Co., Lorain, Ohio
The Lovekin Water Heater Co., 39 Laurel St., Philadelphia, Pa.
The Michigan Stove Co., Detroit, Mich.

WATER STILLS (Gas Heated)

The Improved Appliance Co., 419 Kent Ave., Brooklyn, N. Y.
Young Bros Co., Detroit, Mich.

WELDED STEEL PIPE

The Bartlett Hayward Co., Baltimore, Md.
Steere Engineering Co., Detroit, Mich.

(Continued from page 662)

A questionnaire has been mailed to all company members to ascertain the class of company membership to which our manufacturer company members are entitled for this year, as well as the names of their travelling representatives.

Inquiry is made as to whether these representatives are members of the Association and if there is not some way of bringing all representatives of company members in as active members of the Manufacturers Section. Each company member has been asked to suggest the names of men interested in Association work and their qualifications.

This cooperation is requested in order that the Secretary may develop a field force of manufacturers' representatives in the interests of the Association, thereby securing new members in the manufacturing field as well gas companies. There is no reason why every representative of a company member should not cooperate with the Manufacturers Section in building up the membership of this Association, for without that support, the work of the Association cannot go on.

Every manufacturer company member who has not sent his questionnaire to the Secretary of the Manufacturers Section, should do so without further delay, to cooperate in this work.

To Manufacturers in the Gas Field

Do you want standard specifications adopted in the line of your manufacture? Your best hope for results lies in cooperation with the American Gas Association's activities in standardization.

(See page 646)

"Every man owes some of his time to the upbuilding of the profession to which he belongs."—Theodore Roosevelt.

GENERAL ACTIVITIES

CHAIRMEN OF COMMITTEES ORGANIZED TO DATE

National Bureau of Standards (Advisory Committee)—O. H. FOGG, New York, N. Y
Beal Medal—GEO. B. CORTELYOU, New York, N. Y.
Accident Prevention—JAMES B. DOUGLAS, Philadelphia, Pa.
Amendments to Constitution—WM. J. CLARK, Mt. Vernon, N. Y.
Chamber of Commerce, Membership in—
Calorific Standards—J. B KLUMPP, Philadelphia, Pa.
Educational—WALTON CLARK, Philadelphia, Pa.
Finance—E. H. ROSENQUEST, New York, N. Y.
Gas & Electric Service (National)—W. H. GARTLEY Philadelphia, Pa.
Funds for Gas & Electric Service—H. L. DOHERTY, New York, N. Y.
National Fire Protection Assn., Membership in—W. R. ADDICKS, New York, N. Y.
Relations with Other Assns., etc. (Formation of Geographic and Company Sections)
Standard Gas Appliance Specifications—W. T. RASCH, New York, N. Y.

With regard to the discussion at the October meeting, relative to the establishment of a Central Research and Development Laboratory, the Executive Board at a meeting on October 30 authorized the President to appoint a special committee, representative of all the interests involved, to consider and report to the Executive Board their recommendations with regard to such a laboratory.

The Standard Gas Appliance Specifications originally prepared and distributed by the N. C. G. A. several years ago will be revised and brought up-to-date this year. The Executive Board authorized the President to appoint a committee for this purpose, consisting of nine members, five of them gas company representatives and four representatives of appliance manufacturers.

Government Ownership Report

We have on hand a number of copies of the Report of Special Committee (The Merchants Association of New York) on Government Ownership and Operation of Public Utilities. Copies of this interesting report were sent to all member companies on our rolls as of February 28, 1919. But if others are required they will be supplied promptly on request—without charge.

A. G. A. Endorses "Our Country First" Resolutions

Under the auspices of the Illinois Manufacturers' Association (D. E. Felt, President) a conference was held in Chicago on September 8 and 9, 1919. This gathering, designated as "Our Country First" Conference, brought together men of widely separated interests and among the representatives were Mr. Geo. D. Roper and Mr. B. J. Mullaney for the American Gas Association.

A series of twelve resolutions concerned with the rights of private property, the transportation problem, relations of employer and employee, and other kindred matters of present interest, were passed by the conference and referred to the other organizations represented, for their individual approval. At a meeting of our Executive Board on October 13, the American Gas Association endorsed the action of the Illinois Manufacturers' Association.

A Visitor From London

Through the courtesy of Mr. F. W. Goodenough of the British Commercial Gas Association, we recently had the pleasure of meeting Mr. H. Austen Hall, F. R. I. B. A., who undertook during his visit to America to obtain for the B. C. G. A., particulars concerning especially interesting gas showrooms and offices in this country.

New Members Enrolled in the American Gas Association, Inc.
October 8—November 15, 1919.

GAS COMPANY MEMBERS

Gas & Electrical Dept. ..... George H. Fullerton, Norwich, Conn.
Peoples Gas & Electric Co. ..... F. J. Hanlon, Mason City, Iowa
Iowa Gas & Electric Co. ..... H. F. Darbyshire, Washington, Iowa
Wisconsin-Minnesota Light & Power Co. .... Red Wing, Minn.
Wisconsin-Minnesota Light & Power Co. .... Winona, Minn.
Laconia Gas & Electric Co. ..... F. T. Brockington, Laconia, N. H.
Suffolk Gas-Electric Co. ..... George F. Kindley, Suffolk, Va.
Martinsburg Heat & Light Co. ..... Leon H. Ware, Martinsburg, West Va.
Wisconsin-Minnesota Light & Power Co. .... Chippewa Falls, Wis.
Wisconsin-Minnesota Light & Power Co. .... P. D. Kline, Eau Claire, Wis.
Wisconsin-Minnesota Light & Power Co. .... La Crosse, Wis.
Cheyenne Light, Fuel & Power Co. ..... C. A. Harrison, Cheyenne, Wyo.

HOLDING COMPANY MEMBERS

Charles H. Tenney & Co..... Palmer York, Boston, Mass.

MANUFACTURING COMPANY MEMBERS

Backus Heater & Foundry Co., Inc. ..... H. A. Knowles, Boston, Mass.
Century Stove & Mfg. Co. ..... Lucius Osgood, Johnstown, Pa.
The Champion Stove Co. ..... O. T. Knight, Cleveland, Ohio
Famous Oven Mfg. Co., Inc. ..... C. H. French, New York, N. Y.
Foundation Oven Corp. ..... W. M. Imbrie, Jr., New York, N. Y.
J. F. Henderson Co. ..... J. F. Henderson, Pittsburgh, Pa.
Laclede Christy Clay Products Co. ..... H. E. Johnson, St. Louis, Mo.
Madsdon Mfg. Co. ..... Geo. W. Campbell, Cambridge, Mass.
Mount Union Refractories Co. ..... F. O. Shoemaker, Mount Union, Pa.
Scott Gas Appliance Co. ..... James G. Scott, Washington, D. C.
Sherwin-Williams Co. ..... John Schlintz, New York, N. Y.
Surety Attachment Co. ..... R. L. Lewis, Nashville, Tenn.

Active Members

ALABAMA

Mobile Gas Co., Mobile
Rufus C. Dawes

CALIFORNIA

D. H. McCorkle Mfg. Co., Oakland
G. D. Mantle
C. B. Babcock Co., San Francisco
C. B. Babcock

CANADA

Consumers Gas Co., Toronto
J. E. Philpott
West's Gas Improvement Co., Westmount
F. J. Kennedy

CONNECTICUT

Weir Stove Co., Meriden
Irving D. Fowler
New Haven Gas Light Co., New Haven
Frank J. Shields

DISTRICT OF COLUMBIA

Pittsburgh Water Heater Co., Washington
J. L. Walker

ENGLAND

West's Gas Improvement Co., Ltd., Manchester
Fred J. West

GEORGIA

Gas Light Co. of Columbus, Columbus
R. Meadows
Carl A. Pierson
S. H. Reid

ILLINOIS

Gehnrich Indirect Heat Oven Co. Inc., Chicago
H. P. Rasmussen
Peoples Gas Light & Coke Co., Chicago
J. E. Davies
Bernard J. Mullaney
John M. Roberts
Public Service Gas Co. of Illinois, Chicago
Stanton B. Cushing
Western Representative Gas Age, Chicago
Edwin F. Ripley
George D. Roper Corp., Rockford
Wm. L. Powers

INDIANA

Central Indiana Gas Co., Anderson
R. A. Zeigler
Citizens Gas Co., Indianapolis
Edward J. Burke

IOWA

Des Moines Gas Co., Des Moines
Phil Devine
Johnson Gas Appliance Co., Cedar Rapids
W. G. Haskell

MAINE

Portland Gas Light Co., Portland
Col. Fred. N. Dow

MARYLAND

Citizens Gas Co., Salisbury
Harold W. Smith
Chambers Mfg. Co., Westminster
Geo. W. Arnold

MASSACHUSETTS

Fall River Gas Works Co., Fall River
Warren D. Stewart
West Boston Gas Co., Framingham
Frank W. Jennings
Perry Barker Co., Boston
Perry Barker
Gas & Electric Improvement Co., Boston
C. N. Bromell
The Gas Machinery Co., Boston
Edwin E. Witherby
Chas. H. Tenney & Co., Boston
Herbert A. Gidney

MICHIGAN

Young Bros. Co., Detroit
George A. Young

MISSOURI

Parker, Russell M. & M. Co., St Louis
L. G. Crenshaw
L. Parker

NEW JERSEY

Public Service Gas Co., Arlington
Clinton D. Myer
Public Service Gas Co., Camden
E. Foster Coffman
Public Service Gas Co., Englewood
O. T. Culver
Public Service Gas Co., E. Orange
Chas. Z. Kent
The Koppers Co., Jersey City
Chas. R. Meissner
Public Service Gas Co., Jersey City
Martin J. White
Public Service Gas Co., Newark
Harry H. Bowly
A. Brandt
Sidney Curren
S. S. Ellis
W. C. Hayden
B. C. Lyons
Arthur H. Maguire
Henry Muller
John A. Scheller
Henry P. J. Steinmetz
Public Service Gas Co., Paterson
Edgar Atherton
Ralph C. Johnson
Henry W. Nicolson
Otto Reiner
Public Service Gas Co., Plainfield
Wm. F. Terradell, Jr.
Public Service Gas Co., Princeton
W. R. Brearley
Public Service Gas Co., Riverton
Malcolm M. Dickinson
W. A. Major, Jr.
Public Service Gas Co., Trenton
Wm. J. Harvey

NEW YORK

Municipal Gas Co., Albany
Le Roy D. Parmelee
Brooklyn Union Gas Co., Brooklyn
Chester M. Braham
George S. Cremer
Clement E. Goldsmith
Theodore B. J. Merkt
Fred B. Parke
Edward M. Raleigh
Robt. H. Staniford
George P. Velte
D. C. Weeks
Superior Meter Co., Brooklyn
John F. Smith
National Stove Co., Div., Buffalo
W. A. Linabury
N. Y. & Queens Gas Co., Flushing
Wm. Raynor
Central Hudson Gas & Electric Co., Newburgh
R. B. Thompson
Cities Service Co., New York
J. R. Wohrley
Consolidated Gas Co., New York
A. C. vanden Driessche
Frederick L. Mueller
Frederick A. Reuss
Henry L. Doherty & Co., New York
W. P. Strobhar
The Long, Landreth, Schneider Co., New York
J. V. Landreth
Manhattan Gas Heating Co., New York
Wm. T. Moore
Public Service Commission, New York
Wm. Merrifield
Republic Flow Meters Co., New York
S. A. Reinhard
United Lead Co., New York
J. Wakeman Spotten
The Union Stove Works, New York
Edward G. Seewald
J. G. White Management Corp., New York
J. I. Mange
A. H. Wolff Gas Radiator Co., New York
Lewis S. Baxter
Peoples Gas & Electric Co., Oswego
M. S. Hammer
Republic Light, Heat & Power Co., Tonawanda
Guy C. Messmar
Westchester Lgt. Co., White Plains
John S. Acton
Public Service Gas Co., Yonkers
Chas. P. Marsden

NEW ZEALAND

Greymouth Gas Co., Greymouth
Jas. Kennedy
Palmerston North Gas Co., Palmerston
N. J. Kennedy

NORTH CAROLINA
Southern Public Utilities Co., Charlotte
S. L. Duckett
J. A. Forney
Concord & Kannapolis Co., Concord
J. S. Palmer
Carolina Power & Light Co., Raleigh
C. M. Craig
Winston-Salem Gas Co., Winston-Salem
Noble L. Clay

OHIO
The Cleveland Heater Co., Cleveland
Arthur Friedman
The Lattimer Stevens Co., Columbus
Chas. W. Stevens
The Estate Stove Co., Hamilton
Albert M. Kahn

PENNSYLVANIA
S. R. Dresser Mfg. Co., Bradford
Merrill N. Davis
Eph Lyon Co., Franklin
Eph Lyon
Conewago Gas Co., Hanover
E. E. Bair
Abram Cox Stove Co., Philadelphia
Evins F. Glore
Andrew B. Valentine
Montrose Pocohontas Coal Co., Philadelphia
Henry Wharton
Public Service Gas Co., Philadelphia
S. H. Cauffman
Bureau of Mines, Pittsburgh
Arno C. Fieldner
The Koppers Co., Pittsburgh
David L. Jacobson
Howard B. Young
Philadelphia Co., Pittsburgh
A. W. Thompson
Chemical Service Laboratories, West Conshohocken
Horace C. Porter

PHILIPPINE ISLANDS
Manila Gas Corp., Manila
E. Odrich

RHODE ISLAND
Providence Gas Co., Providence
C. Earl Littell

SOUTH CAROLINA
Southern Public Utilities Co., Greenville
H. E. McDonnold

UTAH
Utah Power & Light Co., Ogden
A. P. Merrill

VIRGINIA
Gas Appliance Stove Co., Norfolk
John W. Franke

NEW SECRETARY FOR ILLINOIS ASSOCIATION

Horace H. Clark has resigned as Secretary-Treasurer of the Illinois Gas Association effective March 18, 1920. Mr. R. V. Prather has been appointed in his place and will work with Mr. Clark until the close of the coming Convention in March, 1920, at which time Mr. Prather will take the office.

Mr. Clark has served as Secretary-Treasurer for the past eight years but finds his time too much taken by other duties to serve longer. Mr. Clark is Industrial Gas Engineer of the Public Service Company of Northern Illinois located at Chicago and has recently been appointed Chairman of the Industrial Fuel Committee of the American Gas Association. He is also Chairman of the Gas Engineering Section of the Western Society of Engineers; Chairman, Chicago Chapter, American Steel Treaters' Society; Vice President of the Fuel Auxiliary of the Illinois Manufacturers' Association; and has been appointed Chairman of the Exhibit Committee for the Illinois Gas Association's Exhibit to be held in Chicago, March 16th to 18th, 1920.

Mr. Prather is now Secretary of the Illinois State Electric Association and the Illinois Electric Railways Association and was formerly Secretary of the State Public Utilities Commission of Illinois, and has been associated with utility companies for many years. His office is now in Springfield, Illinois, in the DeWitt-Smith Building, and henceforth the Association will maintain two offices, one in Chicago and one in Springfield.

WOULD END SRIKES IN PUBLIC UTILITIES

Merchants' Association Suggests Enlistment of Men for Definite Period

A plan intended to end strikes in public utilities by means of enlisting workers for a prescribed term of service has been suggested by the Merchants' Association to the Chamber

(Continued on page 684)

Associations Affiliated with A. G. A.

Canadian Gas Association

Pres.—V. S. McIntyre, Kitchener, Ont.
V.-Pres.—C. S. Bagg, Montreal, Que.
E. H. Caughell, St. Thomas, Ont.
Sec.-Tr.—G. W. Allen, 19 Toronto St., Ontario, Can.
Conv., 1920.

Empire State Gas & Electric Association

Pres.—Horace L. Mann, Buffalo, N. Y.
V.-Pres.—H. W. Peck,
C. G. M. Thomas.
Treas.—E. H. Rosenquest.
Sec.—C. H. B. Chapin, 29 W. 39th St., New York, N. Y.

Illinois Gas Association

Pres.—H. S. Whipple, Rockford, Ill.
V.-Pres.—W. M. Willett.
Sec.-Tr.—H. H. Clark, 72 W. Adams St., Chicago, Ill.
Conv., 1920, March 17-18.

Indiana Gas Association

Pres.—R. A. Ziegler, Anderson, Ind.
V.-Pres.—J. D. Forrest.
Sec.-Tr.—E. J. Burke, Citizens Gas Co., Indianapolis, Ind.
Conv., 1920, April 28.

Iowa District Gas Association

Pres.—Geo. D. Roper, Rockford, Ill.
V.-Pres.—W. H. Taylor,
C. N. Chubb.
Sec. Tr.—H. R. Sterrett, Des Moines Gas Co., Des Moines, Ia.
Conv., 1920.

Michigan State Gas Association

Pres.—E. C. Campbell, Benton Harbor, Mich.
V.-Pres.—J. W. Batten, Detroit, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.
Conv., 1920.

New England Association of Gas Engineers

Pres.—A. M. Barnes, Cambridge, Mass.
V.-Pres.—W. F. Norton,
Burton Smart.
Sec.-Tr.—N. W. Gifford, 38 Central Sq., East Boston, Mass.
Conv., 1920, Feb. 18-19—Boston, Mass.

New England Gas Sales Association

Gov.—William Gould, Boston, Mass.
Sec.—John B. Anderson, 46 Center St., Brockton, Mass.
Treas.—W. T. Pease, Boston, Mass.

New Jersey State Gas Association

Pres.—C. W. Hoy, Glassboro, N. J.
V.-Pres.—R. H. Garrison.
Sec.-Tr.—Wm. P. Adams, Millville, N. J.
Conv., 1920.

Pacific Coast Gas Association

Pres.—A. B. Day, Los Angeles, Calif.
V.-Pres.—L. B. Jones, San Francisco, Calif.
Sec.-Tr.—Henry Bostwick, 445 Sutter St., San Francisco, Calif.
Conv., 1920.

Pennsylvania Gas Association

Pres.—G. F. Speaker, Lebanon, Pa.
V.-Pres.—O. H. Heckert,
J. L. Mather.
Sec.-Tr.—L. R. Dutton, Jenkintown, Pa.
Conv., 1920, April 14-15—Philadelphia, Pa.

South Central Gas Association

(formerly Texas Gas Association)

Pres.—P. E. Nicholls, Galveston, Texas.
V.-Pres.—C. B. McKinney, Dallas, Texas.
F. L. Weisser, San Antonio, Texas.
Sec.-Tr.—C. H. Seidenglanz, 1501 Commerce St., Dallas, Texas.
Conv., 1920.

Southern Gas Association

Pres.—Noble Clay, Durham, N. C.
V.-Pres.—E. S. Dickey,
J. H. Haggerty.
Sec.-Tr.—M. A. Bowlin, Macon, Ga.
Conv., 1920, Norfolk, Va.

Wisconsin Gas Association

Pres.—Bruno Rahn, Milwaukee, Wis.
Sec.-Tr.—Henry Harman, 182 Wisconsin St., Milwaukee, Wis.
Conv., 1920, Milwaukee, Wis.

OTHER ASSOCIATIONS

Natural Gas Association of America

Pres.—Bert. C. Oliphant, Buffalo, N. Y
V.-Pres.—Harry J. Hoover,
Ogden K. Shannon,
H. A. Quay.
Sec.-Tr.—Wm. B. Way, 904-5 Oliver Bldg., Pittsburgh, Pa.
Conv., 1920, Atlantic City, N. J.

Society of Gas Lighting

Pres.—Alex. H. Strecker, Newark, N. J.
V.-Pres.—W. Cullen Morris.
Sec.—Geo. G. Ramsdell, 130 E. 15th St., New York, N. Y.
Treas.—Wm. J. Welsh.
Conv., 1919, December 11.

Southwestern Electrical and Gas Association

Pres.—Burr Martin, Dallas, Texas.
V.-Pres.—A. Hardgrave,
C. E. Corder,
A. H. Warren.
Sec.—H. S. Cooper, Slaughter Bldg., Dallas, Texas.
Treas.—J. B. Walker.
Conv., 1920.

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Jour. R. Soc. of Arts—Journal of the Royal Society of Arts (John St., Adelphi, London, W. C. 2).
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Presidential Address	G. B. Cortelyou	A. G. A. Monthly, Oct., 539 Gas Age, Oct. 15, 351 Gas Record, Oct. 22, 29 Gas Record, Oct. 22, 27
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(Continued from page 676)

of Commerce of the United States. It is the idea of Henry R. Towne, head of the Yale & Towne Manufacturing Company.

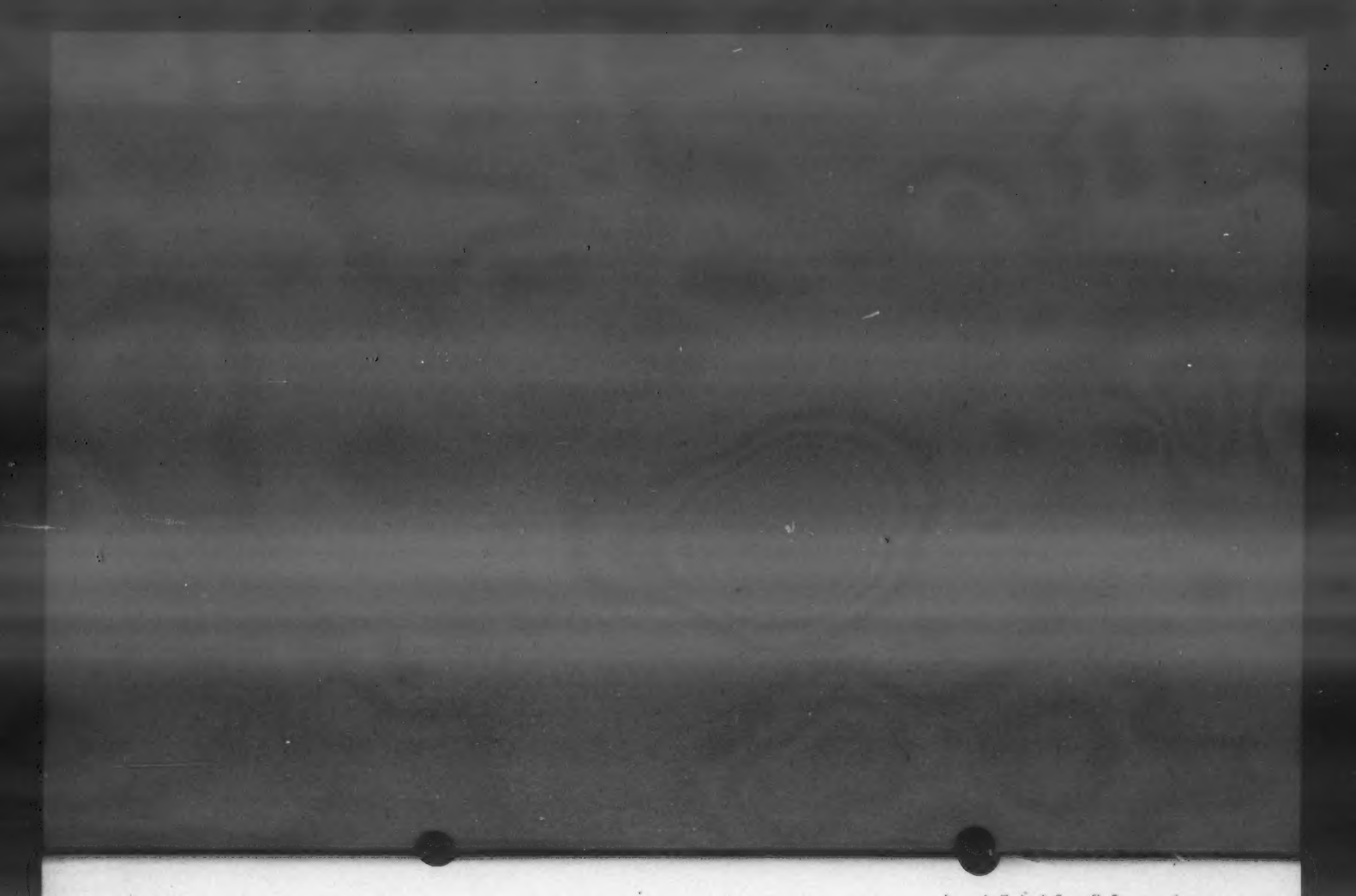
The idea is based on the assumption that, since the functions of public utilities are exercised by public authority, delegated to corporations, one great need is continuous and unimpeded operation. This cannot be attained unless employees can be held to their jobs.

The employees would be enlisted for a specified term, during which they could not leave the employer and the employer could not discharge them, except as provided by terms of a contract. Violation of the contract by either side would be punishable by law.

The plan also recognizes the right of employees to join any lawful organization. An Arbitration Board would be made up of representatives of the corporation and the workers. Both sides would have the right of appeal to a Federal or State Commission.

The Chamber of Commerce is asked to take a referendum on the plan, and, if approved, to make it compulsory by law.

—*Evening World* (New York)
Oct. 20, 1919.



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